The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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CHRISTMAS HOLIDAYS.

In consequence of the Christmas Holidays, the Offices of THE CHEMICAL AGE *will be closed next week on Tuesday and Wednesday. Communications for next week's issue should reach the Editor or Publisher not later than Monday, December 24.*

A Christmas Greeting

IT is again our pleasant duty, almost on the eve of Christmas, to wish our many friends at home and overseas a Merry Christmas and a Prosperous New Year. This year, but for one matter of imperial concern, it would have been possible to do so with a feeling of reality, for the signs on every side in British chemical industry point to a steady recovery of lost ground and to increasing stability of trade and conditions for the future. Anxiety has almost disappeared and confidence is rapidly returning.

The one shadow on this pleasant prospect is the prolonged illness of the King, which has been followed throughout the nation and the Empire, among all classes, with a sympathy and reverence almost without parallel. The King's condition remains serious, and restoration must be slow, but happily within the last day or two the bulletins have been of a more hopeful character. The signs, though slight, of definite improvement that they indicate, have been welcomed with thankfulness, and all citizens will join in the prayer that they may daily be continued and confirmed. The best Christmas message that could reach the King's subjects in every clime would be the news on Christmas morning that His Majesty had passed the danger point and was safely on his way to recovery. The familiar words, "God Save the King," now invested with a new and pointed meaning, express at this season the thoughts and hopes of us all.

Our Annual Review Number

NEXT week we publish the Annual Review Number of THE CHEMICAL AGE, which promises to be the largest single issue of this journal yet produced. THE CHEMICAL AGE was the first publication to give the chemical industry a critical and historial survey of the year's events and developments. It has since had several imitators, who have thus paid us what is supposed to be the highest compliment, but it still retains its original place in this field. This issue is known overseas almost as widely as it is at home. It is filed for reference among the current literature of the industry. Frequent demands reach us for copies long out of date. We shall be printing a much larger issue than usual to meet such demands, but in view of past experience, those who wish to make sure of their copy should order in time. A good companion volume to the Annual Review Number is *The Chemical Age Year Book, Diary, and Buyers' Guide for* 1929, which is just out of the press. This publication, also unique in the industry, is supplied free to regular subscribers, and can be obtained by non-subscribers at 10s. 6d.

We are again indebted to many distinguished contributors for their valued aid in the production of this year's Annual Review Number. Among the principal features may be mentioned an article, as in past years, by Sir William Alexander, M.P., on the chemical trade developments of 1928, and a particularly comprehensive analysis and survey of British chemical industry generally by Mr. Davidson Pratt, general manager of the Association of British Chemical Manufacturers. Dr. E. B. Maxted, the well-known authority on nitrogen, will contribute, as usual, his careful and accurate summary of the principal technical advances of the year. An authoritative account, of great interest and value, of the operations and policy of Imperial Chemical Industries, indicates the achievements up to date and the lines of development for the future. Affairs in the dyestuffs industry will be dealt with, from the user's point of view, by Mr. Sutcliffe Smith, chairman of the Colour Users' Association, and from

the technical point of view by Mr. L. J. Hooley (of Scottish Dyes, Ltd.). An article of great scientific interest describes with real insight and knowledge the work of the National Chemical Laboratory at Teddington. Conditions in the heavy chemical industry and in the chemical engineering field will be dealt with respectively by Mr. P. Parrish and Mr. S. J. Tungay, two of our earliest contributors. Dr. J. Vargas Eyre, Research Director to the Distillers' Co., discusses recent developments in the solvent industry; Mr. Alan A. Drummond deals with the subject of synthetic resins, and Dr. Malcolm Dyson writes on medicinal chemicals in 1928. The important subject of fertilisers is reviewed by Mr. A. B. Bruce (of Nitram, Ltd.). Not the least valuable of the contributions is our very competent Patents Correspondent's review of the chemical inventions of the year. Finally, there will be the customary notices of the work of the various chemical and allied societies.

Chemical Overseas Trade

THE figures of November chemical overseas trade contained in the Board of Trade returns published in our last issue are reassuring, not merely because they show an advance over the corresponding month of last year, but because they confirm the favourable tendency exhibited for some time past. The imports, it is true, have increased more than the exports (£246,189 as compared with £15,502), but the re-exports are up by £41,209. The general volume of trade is clearly increasing. Taking the eleven months ended November 30, imports have increased by £101,126 over the same period of 1927, exports have increased by £1,978,216, and re-exports have increased by £7,633, altogether a satisfactory and encouraging record.

Coming to the detailed figures, the chief increases in the imports are in tartaric acid (£3,982 to £17,452), coal tar products (£11,002 to £27,438), potassium compounds, other than nitrate (£60,731 to £84,158), and miscellaneous items £249,269 to £545,904. On the export side there are numerous small declines, but these are more than balanced by the increases in ammonium sulphate from £201,151 to £316,814 and in dyes and dyestuffs from £73,325 to £107,716.

Building Research

IN the first serial report of the work of the Department of Scientific and Industrial Research on Building Research, published last year, a summary was given of the position up to December 31, 1926. The report for 1927, which is just announced, provides an account of the further progress made. In reviewing the year's work three items serve. The first illustration is the investigation into the uses of clinker and other spent coal products, as aggregates in concrete. It is believed that the reasons for the very large number of failures experienced in practice with these materials have been elucidated, and that simple tests for the detection and rejection of unsuitable samples will soon be evolved. The second item is the work on cement and concrete, in which it has been shown in particular how important it is to take regard of the stress introduced by the shrinkage of cements and concretes during setting, hardening and drying. The causes of some of the phenomena observed cannot be ascertained until the physical chemistry of cements is further advanced, along the lines of the third item, which is concerned with the fundamental study of gel structures.

The first part of the report deals with general research and special researches. The outstanding feature of this portion is the discussion of the weathering of building stone and building materials in general. A special note is added on efflorescences. Another important subject considered is the decay that may occur if different stones are associated in the same building. The portion of the report dealing with intelligence and special investigations contains brief summaries of a number of investigations.

Books Received

DIE PARFUMERIEINDUSTRIE. By Alfred Wagner. Halle: Wilhelm Knapp. Pp. 596. Paper covered, RM. 26.50; cloth, RM. 29.

THE RATIONAL CLEANING OF COAL. By R. Lessing, Ph.D., F.I.C., F.Inst.F., M.I.Chem.E. Pp. 12. Reprinted from the *Journal of the Institute of Fuel.*

The Calendar

1929		
Jan.		
3	Society of Chemical Industry (Bristol Section). Joint Meeting with the Chemical Society. "Some Properties of Flame and Combustion." Professor W. E. Garner. 7.30 p.m.	University, Bristol.
7	Society of Chemical Industry (London Section). Joint Meeting with the Fuel Section. "The Action of Hydrogen upon Coal." J. Ivon Graham. 8 p.m.	Burlington House, Piccadilly, London.
7	Institution of the Rubber Industry (London Section): "Factory Organisation in the Rubber Industry Affecting the Conditions of the Worker. F. W. Bennett."	Blackfriars Theatre, Lever House, London, E.C.
8	Hull Chemical and Engineering Society: "Electric Cranes." G. R. Adamson and C. F. Tinker. 7.45 p.m.	Grey Street, Park Street, Hull.
8, 9 & 10	Optical and Physical Societies: Annual Exhibition of Scientific Apparatus.	Imperial College of Science and Technology, London.
9	Institute of Metals (Swansea Section): "Pulverised Coal in Metallurgy." G. E. K. Blythe. 7 p.m.	Thomas' Café, High Street, Swansea.
9	Institute of Fuel: "The Application of Pulverised Fuel Firing for Lancashire Boilers." H. A. S. Gothard.	London.
10	Institute of Chemistry (Manchester Section): "Pregl's Micro-methods of Analysis." H. D. K. Drew.	Manchester.
10	Oil and Colour Chemists' Association: "Nitro-cellulose Lacquers." Bertram Campbell. 7.30 p.m.	30, Russell Square, London.
10	Institute of Metals (London Section): "The Lead Industry." H. C. Lancaster. 7.30 p.m.	83, Pall Mall, London.
11	Society of Chemical Industry (Manchester Section): Short Papers by Members.	Manchester.
11	Institute of Chemistry and Society of Chemical Industry (South Wales Section): "The Preparation of Coal for Market." 7.30 p.m.	Thomas' Café, High Street, Swansea.
11	Chemical Engineering Group: "The Relative Safeties of Mild and High Tensile Alloyed Steels under Alternating and Pulsating Stresses." Professor B. P. Haigh.	London.

Report of the Water Pollution Research Board

An Account of the Past Year's Activities

The Department of Scientific and Industrial Research has just issued "The Report of the Water Pollution Research Board for the Year 1927–8," published by H.M. Stationery office (pp. 18, 6d.). An account of the report is published below.

THE Water Pollution Research Board was appointed in June, 1927, with the following members: Sir Robert Robertson, F.R.S., Government Chemist (Chairman), Professor V. H. Blackman, F.R.S., Professor G. C. Bourne, F.R.S., Professor F. G. Donnan, F.R.S., Sir Alexander Houston, and Mr. H. C Whitehead. Dr. H. T. Calvert, chemical inspector of the Ministry of Health, was appointed part time Director of Research at the same time.

The Board's first act was to arrange for the preparation of monthly summaries of current literature, which, while compiled primarily for its own use, are issued (to the extent of some 70 copies) to Government departments, libraries, universities, scientific and technical bodies, etc. At the present time no charge is made, but should a sufficient demand arise, it is suggested they might be published and placed on sale by H.M. Stationery Office. From time to time, reports of the investigations completed under the supervision of the Board will be published.

The Question of Inquiries

Apart from publications (states the report), the Director of Resarch will always be glad to give such scientific and technical information as he may be able to do to any *bona fide* inquirer, and to discuss problems in general terms with those who care to bring them to his notice. But the Board thinks it desirable, in order to prevent any misapprehension, to explain that, in accordance with the general policy of the Conncil for Scientific and Industrial Research, the Director cannot advise on any questions such as are commonly dealt with by consultants. It is the Director's business to maintain touch with those who are concerned with the disposal of pollution effluents and the purification of water-supplies, acquainting himself with their problems and calling their attention, where necessary, to relevant scientific and technical research; it is not his business, in any sense, to invade the province of the consultants whose professional services may readily be procured.

The investigations carried out hitherto in this country have been somewhat scattered and isolated, and very little has been done in the way of co-ordinated attacks upon problems. Much valuable work, however, has been done and is being done, and serious attempts are now being made, with every prospect of success, to co-ordinate work in certain fields. In this connection, the report mentions the research committees established by the Royal Sanitary Institute, the Association of Managers of Sewage Disposal Works, the Institution of Gas Engineers and the Beet-Sugar Factories Committee of Great Britain, with all of which the Board is in close touch through the medium of Dr. Calvert.

Survey of the River Tees

Early in its deliberations, the Board came to the conclusion that a general biological and chemical survey of a typically polluted river from source to mouth would furnish information of great value and of general as well as local application. The success of an investigation of this character would clearly depend on the choice of the right river for the purpose, and on the co-operation of all the local interests involved. The Board had in mind the River Tees, which, starting from its source a pure stream, receives a variety of domestic and industrial effluents in its course and ends in a tidal estuary, thus offering as wide a field of investigation as could be found.

The Board therefore welcomed an application from the Tees Fishery Board for a grant in aid of research on the pollution of the river, especially as a most useful beginning had been made in co-operative work by a joint committee representing the Fishery Board and local industrial interests, and a small laboratory had been provided with the help of the Ministry of Agriculture and Fisheries. On the recommendation of the Board, the Department of Scientific and Industrial Research suggested that the existing joint committee, enlarged by the addition of representatives of the other local interests and of the Department, should draw up a comprehensive scheme of investigation, and promised sympathetic consideration to an application for a grant towards the cost. Representatives of the Department have met the joint committee and discussed the proposal, but a definite decision has not yet been reached.

Programme of Research

The field for research with which the Board is entrusted may be divided into water supply, sewage disposal, and industrial effluents. In regard to water-treatment, rapid progress is being made in this country in three directions, namely, rapid filtration, chlorination, and softening by the base-exchange or zeolite process. Work on the first two methods is being carried out by the Metropolitan Water Board. With regard to the base-exchange process, the Department of Scientific and Industrial Research has arranged for an investigation to be carried out by the Chemical Research Laboratory at Teddington, with special reference to the following points:—The rate and the extent of the base-exchange; the wastage of the material; the possibility of the contamination of the softened water by silica and alumina; how far the action is a surface one, depending upon the size and texture of the particles of the base-exchange material; and the process of regeneration.

With regard to sewage disposal, it has been arranged for an investigation of the activated-sludge process of sewage disposal to be carried out, on biological lines, at the London School of Hygiene and Tropical Medicine, under the direction of Professor W. W. C. Topley.

The opinion of the Board with regard to industrial effluents is that the most urgent need is to prevent the occurrence of pollution from new sources. In the first instance, the question of beet-sugar effluents has been taken up. As the results obtained by biological filtration of beet-sugar effluents seemed promising, arrangements were made for a trial on the semi-commercial scale at the beet-sugar factory at Colwick, through the kindness of The Anglo-Scottish Beet-Sugar Corporation, Ltd. At this factory, two experimental filters, each 25 ft. in diameter and 6 ft. deep, were constructed to the designs of Mr. H. C. Whitehead, A.M.Inst.C.E., Engineer to the Birmingham, Tame and Rea District Drainage Board, and much valuable information was obtained. The problem is not yet solved, but the results already obtained, together with those obtained in the concurrent further experiments on the laboratory scale, lead to the view that a practicable solution of it may be found in biological filtration, and have enabled the Board to plan a further series of experiments on the semi-commercial scale. This investigation is being carried out in co-operation with the industry, which has contributed £1,000 to the cost on the recommendation of the Effluents Sub-Committee of the Beet-Sugar Factories Committee of Great Britain.

The ideal solution of the problem of pollution would clearly be so to alter the processes that no waste water of any kind had to be discharged, and the industry has constantly in mind the desirability of re-using water to the fullest practicable extent. As a rule, less drastic treatment should be needed to render the waste waters fit for re-use than for discharge to a stream, and the Board believes that the best chance of an immediate reduction in the pollution due to beet-sugar factories' effluent lies in this direction.

The Report of the Director

Appended to the Board's report is the first annual report of the Director of Water Pollution Research, Dr. H. T. Calvert. This gives a detailed account of the work on biological filtration mentioned above. Reference is also made to the co-ordination of the work of the Board with that of the Research Sub-Committee of the Institution of Gas Engineers on gas-works effluents and with that of the Research Committee of the Association of Managers of Sewage Disposal Works.

The Pollution of Streams by Acid Mine Water

An American Investigation of the Problem

In view of the great attention which is now being paid to the question of river pollution, the following article, issued by the United States Bureau of Mines, is of interest.

THE neutralisation of acid mine waters, which drain into rivers and creeks, thereby constituting a serious sanitary problem, can be successfully accomplished, so far as chemical and mechanical factors are concerned, declares the United States Bureau of Mines, Department of Commerce, which has been investigating this matter. It is, however, pointed out that the final problem of neutralisation of such waters is really one of economics. In that aspect, it must be considered separately for specific sections or communities. The factors involved are of such a nature that one hard and fast rule cannot be applied with equal satisfaction to all cases.

The pollution of streams has received much attention during the last few years, and although there are many more serious forms of pollution, the problem of acid mine drainage is important in certain sections of the United States, particularly in Pennsylvania. At the request of the United States Public Health Service, the U.S. Bureau of Mines undertook to determine some of the factors contributing to formation of acid mine waters, the yearly variations in quantity and quality of drainage, effect of mining methods, and various other questions arising in connection with the problem. Some attention was also given to its economic phases.

Observation of Mines

A stream having a number of mines draining into it was selected for observation in both high-sulphur and low-sulphur bituminous-coal districts. These mines and streams were visited in both wet and dry seasons to note the quantity and variations in acidity of mine drainage and the subsequent effect on streams. Most of the mines draining into these streams were drift mines. The streams were sampled at regular intervals of about one-half mile, unless entering streams or unusual conditions warranted more frequent samples.

Mine samples showed wide variations in acidity, but consistently indicated that drippers and samples from fresh working faces were, with one exception, almost invariably alkaline or faintly acid because of the presence of bicarbonates or dissolved carbon dioxide in the water. On the other hand, water from inactive or abandoned sections was almost invariably acid to a degree determined largely by the period that the sections had been idle.

Question of Acid Formation

Gobbed material, both inside and outside the mines, is undoubtedly an important source of acid water; but whether the practice is to gob rock and high-sulphur coal inside or outside the mine, the general acidity of the water from the different mines does not show appreciable differences. Outside gob piles are under the most favourable conditions for liberating acid, more so than if the gob material were inside; therefore, it seems that less damage would be done if the acid-forming wastes were left inside. If gob material could be placed in dry sections of the mine and sealed off to exclude air, the minimum formation of acid might be expected.

Water from mines having a linestone floor would be expected either not to be acid or at least to be less so than water from mines in the same district not having a limestone floor. No marked difference has so far been observed in such waters, probably because after a short time the drainage channels become coated with iron oxide, which adheres tenaciously to the stone and protects it from contact with the water. Water from high-sulphur-bearing coal beds is more acid than that from low-sulphur beds.

Abandoned Workings

Abandoned workings are known to have given off water of approximately the same quality and quantity up to at least fifteen years after being abandoned. One abandoned mine has been giving off highly acid water for forty-five years to date; no caving has yet occurred in this mine. Four others exhibit the same characteristic after having been abandoned thirty-five years. Twenty-five abandoned workings showed about the same acidity as eight active mines in one district studied, but in the other district seven abandoned mines showed only about one-half the acidity of the other seventeen active mines.

Seasonal variations play an important part in the effect of mine drainage on streams. The maximum stream volume at flood stage in such localities as those studied may be many times the average volume, because of the rapid run-off. Heavy rains of short duration, therefore, dilute the water to the extent that it may be considered harmless; mine drainage is not increased unless slower soaking rains occur. On the other hand, at periods of low water, usually in August or early September, the stream volume may be almost entirely mine drainage.

So far little opportunity has been afforded for observing the effect of a definite quantity of acid in streams. With one exception, the entry of drainage from successive mines resulted in building up an acidity which decreased only slightly until the stream entered a small river.

Methods of Treatment

At present there seems to be no solution of the problem of stream pollution other than that of chemical neutralisation. Two general methods might be used to treat large volumes of water: one is to feed ground limestone or lime to the raw water, using a baffled flume to mix the lime well, and then permitting the water to flow into natural or artificial settling basins of sufficient capacity to retain the water for four or five hours. During this time the hydrated oxides of iron will settle out and the effluent water will be neutral or alkaline, somewhat harder, but almost clear, and harmless for most purposes if the treatment is carefully controlled. Of the methods now in use this is the cheapest in first cost and the most simple in operation, but leaves the sludge as a material too thin to shovel and too thick to pump. Its subsequent removal and disposal is likely to prove as much of a problem as the original acid neutralisation now appears to be.

One company has used a process which at least results in an oxide of a form easily handled. After being mixed, the water travels through a thickener to a settling tank, and is finally sprayed on a revolving iron drum heated sufficiently to dry the film of oxide sprayed on it in less than one revolution; this is scraped off at the end as a dry yellow powder.

Financial Obstacles

With the exception of some of the larger companies with ample finances or of others whose mines have only slightly acid or alkaline waters that are easily treated or are unnecessary to treat, individual installations of the type just described would prove such a financial burden as to force a great many mines to cease production, unless the additional cost could in some way be distributed over the coal industry as a whole. The solution of the problem of drainage disposal after coal areas have been mined out and acid water still continues to flow for an indefinite time is also uncertain. One possible solution is to seal abandoned mines so as to exclude the air, thus preventing further oxidation of the pyrite. It seems likely that water from such mines would become pure again in less time than if they were not sealed.

Considerable improvement in certain sections that are now being polluted by water from abandoned workings might be accomplished by sealing the mines; the cost would not be great, and the process does not appear difficult in most cases. The success of this scheme seems very probable, because it has repeatedly been shown that where abandoned mines are sealed either by natural caving or by building seals, the water is suitable for all ordinary uses, sometimes even for drinking purposes.

Further information is given in Serial 2,889, "Observations on Acid Mine Drainage in Western Pennsylvania," by R. D. Leitch, associate chemical engineer, copies of which may be obtained from the United States Bureau of Mines, Department of Commerce.

I.C.I. Policy in Australia

An Interview with Mr. B. E. Todhunter During his Visit

A recent issue of the "The Industrial Australian and Mining Standard" contains an interesting interview with Mr. B. E. Todhunter, a director of Imperial Chemical Industries, Ltd., who is at present in Australia exploring the possibilities of the Commonwealth. Mr. Todhunter has visited various states, and at the close of his tour it is expected that a definite pronouncement as to the future activities of Imperial Chemical Industries will be made.

In the interview with the Australian journal, Mr. B. E. Todhunter stated that an experimental plant for the treatment of coal was being sent to the Commonwealth, and that factories for the manufacture of artificial leather and cellulose lacquers were being erected in conjunction with other concerns.

"The formation of Imperial Chemical Industries, and the energy and vision which Lord Melchett and Sir Harry McGowan have devoted to its organisation, have placed the British chemical industry in a stronger position than it has ever occupied among the great industries of the world," he said. "The financial and technical resources at the disposal of the company have enabled it to deal adequately with those new developments which, since the war, have assumed such national importance, and to establish an organisation for research and experiment equal to that of any other nation, which will keep the British industry in the forefront of the world's progress. Products of chemical industry have a universal application, not only to all other industries of importance, but to the daily life of the individual, and its maintenance on a sound foundation is not only a national but an Imperial necessity.

Post-War Developments

"Many of the post-war developments in this field, particularly in the direction of nitrogen products and the scientific treatment of coal, require capital resources of a high order. This has resulted in the aggregation of the industry into powerful groups in the principal industrial countries of the world, and it is only by a combination of resources, such as Imperial Chemical Indistries has brought about, that the British industry can be certain of maintaining its position. I am using the word 'British' in its widest Imperial sense, for we believe that in the present trend of economic development there should be the closest possible industrial association between the Mother Country and the overseas Dominions, and that the interests of both can best be served by intelligent co-operation, rather than by competition within the Empire.

"The synthesis of ammonia and the wide range of products that flow therefrom is perhaps the most important post-war chemical development. It is becoming increasingly evident that in the not far distant future the world must have increasing supplies of nitrogen if its peoples are to be adequately fed. The production of synthetic nitrogenous fertilisers has already outdistanced the natural product, and in the older countries of the world their scientific use is effecting a revolution in agricultural methods. In the Commonwealth, with its vast areas of new lands and the peculiar responsiveness of its soil to the use of phosphatic fertilisers, the immediate necessity for nitrogen is less evident. If, however, Australia is to maintain the fertility of her soils and the prosperity of her primary industries, abundant supplies of nitrogenous fertilisers must ultimately be required, not in substitution for superphosphates, which will probably continue to be Australia's principal need for many years, but in addition thereto. Imperial Chemical Industries have already entered into the manufacture of nitrogenous fertilisers in the United Kingdom on an extensive scale. Their factory at Billingham, which is now approaching completion, has been erected at a cost approaching £16,000,000, and will be capable of producing 750,000 tons of nitrogenous fertilisers yearly. The factory has been brought to a high pitch of technical efficiency, and will eventually supply not only fertilisers, but a wide range of those other products which are derived from recent methods of high-pressure catalysis.

Imperial Agricultural Research

"A large and well-equipped agricultural research station has also been established. This will deal mainly with the application of nitrogen in agriculture, and will be prepared to investigate questions of interest in any part of the Empire. An association with the Waite Institute, in South Australia, has already been established, and an interesting programme of research on the use of nitrogen in wheat-growing in Australia is being carried out. We are now considering the possibility of installing a plant for nitrogen products in Australia on a scale that will enable us to meet the demand which we feel must arise if farmers can obtain their requirements at prices which will give them profitable returns from the use of nitrogenous fertilisers.

Scientific Coal Treatment

"The scientific use of fuel is another chemical development which, owing to its vital importance, has increasingly attracted public attention in recent years, and to which Imperial Chemical Industries has devoted much time and attention. The work done in this connection falls broadly under two main heads—the so-called low-temperature carbonisation of coal, and the production of oil and spirit from coal by hydrogenation, or what is more commonly known as the Bergius process. Low-temperature carbonisation is a vague term, and although it is frequently taken to imply some novel principle in the treatment of coal, it is in effect merely the distillation of coal at temperatures below those in use in standard gasworks practice. The three main products from the coal distilled remain the same—coke, gas, and tar residues—but by varying the temperatures and methods of distillation the relative proportions of these products can be varied, and the object of such variation is to try to obtain a higher economic yield from the coal. An immense amount of work has been done on these lines, and a great variety of methods suggested and experimented with. It is no exaggeration to say that within recent years several hundred patents dealing with this subject have been taken out in the United Kingdom alone, and while some of these have obtained a moderate degree of success within well-defined and rather narrow limits, our investigation into the subject, which we have followed very closely and to which we have devoted a great deal of research, inclines us to believe that there is no process yet developed which is capable of general application or which has prospects of substantial commercial success on a large scale.

"The direct hydrogenation of coal falls into a different category. Put shortly, it consists of subjecting coal and hydrogen together to certain physical conditions, which effect a direct combination between the two, and produce hydrocarbons, from which motor spirit and other similar products can eventually be obtained. In this direction considerable technical success has been achieved. Imperial Chemical Industries have already produced substantial quantities of satisfactory motor spirit from Yallourn lignite. Here again, however, capitalisation of a high order is necessary to instal a plant that will be capable of producing any substantial proportion of Australia's requirements. Much ground has yet to be covered before it can be said that it is practicable to convert the results obtained on a pilot plant into a commercial success, or to manufacture at costs that will be comparable with motor fuels derived from present sources of supply.

A Pilot Plant for Australia

"In order to carry the matter a stage further and to secure reliable data under existing local conditions, Imperial Chemical Industries have arranged to send to Australia a pilot plant capable of producing motor spirit on a semi-commercial scale, with which tests will be made from the wide range of coals which the Commonwealth possesses. This plant is already under construction in England, but some months must elapse before it can be completed and erected. From first to last this experimental work will probably entail expenditure in the neighbourhood of £100,000, but in view of the immense importance of the results not only to Australia, but other parts of the Empire, we regard such an expenditure on experimental work as being fully justified, and as affording the only practicable method of dealing with a problem of this magnitude.

" In some of the secondary chemical industries Imperial Chemical Industries is also embarking on a comparatively large scale in Australia. The Rexine, Pluviusin, and Pegamoid companies which are subsidiaries of Imperial Chemical Industries, and manufacture a wide range of artificial leathers and similar products. have for some time done substantial business in the Commonwealth. Messrs. du Pont de Nemours have also established a wide connection with their well-known Fabrikoid materials, and the companies interested are erecting a joint factory here for the manufacture of these products. This plant is now under construction at Deer Park. It has been designed by the engineers of British and American firms acting in conjunction, and embodies all the latest developments in both British and American practice. While perhaps not the largest factory of its kind, it will certainly be the best arranged and most up-to-date to be found in any country in the world. It will be equipped for a full range of both British and American patterns, and should be sufficient to supply the whole requirements of the Commonwealth. The construction work has been admirably carried out by the contractors, and when complete it will be an installation of which, I think, Australia may well be proud.

Nitrocellulose Lacquers

" Nitrocellulose lacquers, undercoats and other products, which are an industry in some respects cognate to artificial leather, are also being developed in this country by the co-operation of Imperial Chemical Industries and Messrs. du Pont. In this instance, however, they have also associated themselves with the established Australian interests of British Australian Lead Manufacturers, and the factory which is being erected in Sydney will be the result of the joint collaboration of the three firms. As in both of these industries Australia will be able to draw on the technical resources and development of the leading firms in the United Kingdom and the United States, they should be carried on under the most favourable conditions, and be able to give quality and service equal to that of any country in the world."

Samples of Aniline Dyestuffs

In a circular by the British Chemical and Dyestuffs Traders' Association it is stated that in the past, Customs have usually demanded a dyestuffs import licence against the clearance of each trade sample of dyestuffs. The necessity for making application and cost of the licence has been a source of trouble for many years. Frequently it has entailed considerable delay in obtaining delivery from the postal authorities, pending issue of the licence.

Customs have now agreed and advised the Association that :—(1) *Bona fide* trade samples of dyestuffs not exceeding 8 oz. in weight will be allowed to be imported without a dyestuffs import licence ; (2) That such samples must be imported by Parcels Post, their contents declared in the usual manner and the package must be clearly marked " trade sample." It should be noted that Customs have *not* agreed to allow samples of dyestuffs to be imported by letter or sample posts, as is now the case with samples of K.I.D. goods. K.I.D. samples can be sent by letter or sample posts, addressed c/o Customs Officer, G.P.O., E.C.1. Dyestuffs samples must be sent by Parcels Post and declared. They should not be addressed c/o Customs, but direct to the firm in this country.

Chemists and Mathematicians in War

The belief that chemists and mathematicians would be of more service than professional fighters in future wars was expressed by Rear-Admiral J. D. Allen in an address on the League of Nations which he delivered on Tuesday, December 11, to the students of Glasgow University. In the " good old days " war was entirely a matter for professional soldiers and sailors. That idea was obsolete now. If there was another war every single man, woman, boy, and girl would have to take part in it, and they knew that chemists and mathematicians would be of more value than professional fighters. Referring to the laboratories in the country in which scientists were trying to find new kinds of poison gas and better kinds of submarines or mines, the speaker said it would be much better if these clever men could devote all their knowledge and time to something of a more productive nature.

Electricity Station Fumes

Farmer's Appeal Against Corporation Succeeds

Judgment was given by Lords Justices Scrutton, Lawrence and Sankey in the Court of Appeal on Thursday, December 13, on the appeal by Mr. Arthur Farnworth, farmer, of Bromyhurst Farm, Barton upon Irwell, from the judgment of Mr. Justice Talbot at Manchester Assizes dismissing an action by Mr. Farnworth against the Manchester Corporation for an injunction to restrain the Corporation from creating a nuisance at their electricity station at Barton upon Irwell.

Mr. Farnworth alleged that the Corporation allowed sulphur fumes to be emitted from the station, damaging his property and injuring his health. The Corporation admitted the nuisance, but contended that plaintiff's claim could not succeed because their station was of a kind sanctioned by Parliament. Mr. Justice Talbot gave judgment for the Corporation, with costs, holding that they had succeeded in showing the station was of a kind authorised by Parliament, and the nuisance could not be avoided by any means known to science.

Lord Scrutton's Judgment

Lord Justice Scrutton, in giving judgment, said that the fact seemed pretty clear that the station using the coal it did discharged such a quantity of sulphur that fumes mixed with moisture were not diffused or dispersed in the atmosphere, but descended on the appellant's land and damaged it. In view of the fact that it was said other and larger stations were being erected in agricultural districts, the legal effect of this was important. Within their own area it appeared clear that the Manchester Corporation were liable for damage by nuisance, but it was said that they were not liable outside their area because their powers were obtained by a private Act. He could see no reason why Parliament should make the Corporation liable for nuisance in their area and exempt them from liability for nuisance outside their area.

In his view the special Act of 1914 did not vary the operation of the nuisance clause in the general Act of Parliament, and if the nuisance clause was contained in the Act of 1914 it seemed that the Court was bound to hold that the Act of 1914 did not relieve the Corporation of the liability to pay compensation for damage by nuisance from the station.

It was for the defendants to prove that the nuisance was an inevitable result of the working of the station, and they had not satisfied him that they had taken all reasonable precautions to prevent damage.

The appeal ought to be allowed, with costs here and below, up to the present time, and judgment entered for the plaintiff for damages up to the present day. There should also be an injunction to restrain the defendants committing a nuisance by fumes from their generating station, the operation of the injunction to be suspended for a year to enable defendants to adopt such measures as they were advised to stop or mitigate the nuisance, with liberty to apply after a year for suspension or variation of the injunction.

Promoters should not be allowed by abstaining from asking in express words for the exclusion of any duty to make compensation for damage done—a privilege they probably would not get if they asked for it expressly—to argue afterwards that their duty to compensate had been indirectly excluded by obscure inference.

Lord Justice Lawrence dissented, and thought the appeal should be dismissed.

Lord Justice Sankey agreed with Lord Justice Scrutton, and by a majority the Court allowed the appeal, with costs.

Lovering and Co.'s China Clay Business Sold

It is understood that the contract for the sale of John Lovering and Co.'s China Clay business, at St. Austell, Cornwall, has (states the *St. Austell Guardian*) been signed, and the deposit paid. The contract was on the eve of completion to Sir Charles Cottier's syndicate when the latter died. The principals mainly concerned in the purchase are said to be Balfour, Williams and Co., the Liverpool shipping firm, who have hitherto been associated with the China Clay trade as shippers, mainly to America. The purchase price is stated to be £500,000.

Advances in Analytical Chemistry

Dr. J. J. Fox's Address to the Oil and Colour Chemists

Dr. J. J. Fox delivered his presidential address to the Oil and Colour Chemists' Association, in London, at the Institute of Chemistry, on Thursday, December 13, taking as his subject "Some Recent Advances in Analytical Chemistry." Dr. Fox said that although this was the title that had been given to his address, it would be more correct to call it "Recent Applications of Methods of Analysis," because it was with the application of methods and reactions to the requirements of a modern laboratory that he proposed to deal.

New Methods v. Old

When adopting a new method, two points must be met before discarding an old and well-tried one: (1) The method must be at least as accurate as the older for the purpose in view; and (2) It must possess advantages either in saving time or in ease of application. It was therefore his purpose to indicate a few cases (dealing only with inorganic substances) in which some methods of analysis which had recently been worked out had reached the stage which merited the attention of the members of the Association.

The Use of Oxine as a Reagent

The question was frequently put as to whether investigations carried out apparently in the academic field were of use technically, and he thought he could best answer this by giving some examples. The first was the utility of α-hydroxyquinoline or oxine. This substance had the property of forming very insoluble precipitates with a large number of metallic elements, the general type being a precipitate having the composition $M(C_9H_6NO)_2$.

Berg had probably dealt with the oxyquinoline method of estimation and separation of the metals in the most complete manner, and Dr. Fox gave a brief account of it. He also gave demonstrations with manganese, zinc and copper solutions. Oxine could be used with advantage for quantitative estimations, provided the metals which could be precipitated from alkaline tartrate solutions had been separated sharply, which could usually be effected by a second precipitation. Generally the advantage of the method was that it was reasonably delicate and the factor for converting the precipitate to metal was small.

Spacu's Work

Reference was next made to an interesting method of detection and, in some cases, estimation of metals, developed largely by Spacu. The general principle of the test was that, in the presence of a thiocyanate, the careful addition of pyridine precipitated a pyridine thiocyanate complex with the metal in a number of cases. In many cases the precipitate could be weighed directly as precipitate, provided precautions were taken with the washing. It was usually quicker, and as convenient, to ignite the precipitate or to re-dissolve it and determine the separated metal in some other way, but as a confirmatory qualitative test the method was excellent.

He had recently used potassium selenocyanate, and this gave precipitates very similar to the thiocyanates, but with the advantage of a smaller "factor" for conversion to metal. The disadvantage was that potassium selenocyanate was not easy to obtain pure and had a tendency to decompose with liberation of selenium.

Potentiometric Titration

While potentiometric titrations had been described theoretically and practically by numerous workers, the method did not yet seem to be employed so frequently as it might, having regard to the ease of manipulation for practical work. Quite recently Cullan and Horrobin had shown in the *Journal of the Society of Chemical Industry* how readily potentiometric methods could be used in industry and without expensive equipment.

The special advantage of the method was that there was no need to add or use any indicator apart from the reactants themselves, and the colour of the liquid did not interfere. At the end point of a titration involving oxidation-reduction changes or precipitation, the slightest excess of added reagent produced a large change in the ratio of the voltage per unit volume of reagent used, provided the electrodes were properly chosen and the solutions employed were suitable.

An interesting application of the method was the determination of zinc by means of potassium ferrocyanide. In the ordinary method commonly used, the solution of zinc was kept hot and the ferrocyanide was run in, the end point being ascertained by spotting out drops with uranyl nitrate as indicator. This was a good method, but it was rather tedious and involved a correction for the indicator. The potentiometric method was quicker and more direct, and the results agreed with the spotting-out method.

Discussion

Answering some questions, Dr. Fox said he would not recommend the potentiometric method for determining the acid values of varnishes. Neither would he recommend it for oil unless the oil was so dirty that other methods could not be used.

Dr. Cullan mentioned that there were many determinations that could be carried out by the conductometric method which were not so conveniently done by the potentiometric method, and the apparatus required was very simple and need cost only a few pounds.

Mr. R. P. L. Britton asked whether the potentiometric method was suitable for the determination of magnesium in lime. Dr. Fox said that magnesium had been determined by this method in a large number of sea waters.

The Air-Lift

Its Uses as a Chemical Engineering Appliance

At the final 1928 meeting of the Chemical Engineering Group of the Society of Chemical Industry, at Burlington House, London, on Friday, December 14, Mr. Norman Swindin read a paper on "The Air-Lift as a Chemical Engineering Appliance."

Mr. Swindin described the general principle of the lift with reference to the Swindin formula designed to obtain the values separately for loss due to friction, bubble slip, velocity of discharge and entry, and acceleration in the footpiece. The loss due to friction was calculated from an expression due to Reynolds. Bubble slip was derived from experimental values of bubbles of air rising through various solutions. Theoretical formulæ for slip were also mentioned to show how little reliance could be placed on them. Losses at discharge and entry were given in terms of the rising main derived from accepted formulæ. Loss due to disturbance in the footpiece, one of the greatest sources of loss, was calculated on certain assumptions, based on the time of aeration and the acceleration of the rising column. Attention to this fact determined largely the design of the footpiece, which should be of ample proportion.

An example was given for a small rubber hose lift such as would be found in a chemical works, and the curves of each type of loss plotted separately. A family of such curves combined in a three-dimensional model gave a complete history of a lift when the diameter and submergence were fixed. Examples of the best practice of air-lifting were given. Air-lifts worked in two ways, continuous, as in the Frizell system, and intermittent, as in the Pohlé system.

Applications

The author's experiences with air lifts included circulating nitric acid in absorbing towers; lime mixing; circulating large quantities of hot brine, molten sodium-lead alloy and sodamide; and mixing dyestuffs without mechanical agitation. Some of these were described in detail and illustrated. The air-lift action formed an integral part of plant where liquids were heated by the submerged flame burner, and examples were described taken from the design of Submerged Combustion, Ltd. Heating, pumping and circulating were performed simultaneously by controlling the path of the products of combustion by the use of the air-lift. The air-lift as an agitating and pumping device in corrosive atmospheres had the special advantage of removing the expensive air compressing equipment to a distant room free from corrosion.

Objections to the use of the air-lift were dealt with, most of which were shown to be bound up with materials of construction. Some new methods of measuring the flow of corrosive liquids used in testing air-lifts were given.

The Catechin Problem

To the Editor of THE CHEMICAL AGE.

SIR,—In their comments on my letter Drs. Malkin and Nierenstein say (p. 512): "In our opinion Dr. Everest's contribution represents no advance whatever on the work published by Hlasiwetz as far back as 1864 (*Sitzb. Wiener Akad.*, page 6) and cannot seriously be adduced as proof of the constitution of cyanidin."

In respect of the first portion of this (omitting other matters of some importance that were proved by my work), can they quote any portion of Hlasiwetz' paper in which he set out the structural formula for the anthocyan colours, which I put forward in 1914? If not, Drs. Malkin and Nierenstein's comment is only another instance of carelessness of statement, similar to some already pointed out. With regard to the second portion of their comment, I would suggest that they read my previous letter, page 490, again and more carefully. There are other points in their remarks and in their *Berichte* paper, of which they kindly sent me a copy, which do not carry conviction, but it appears useless to comment further. Professor Robinson's letter on page 512 very aptly states my own feelings.—Yours, etc.

ARTHUR E. EVEREST.

December 13.

Fastness to Sulphur Dioxide

To the Editor of THE CHEMICAL AGE.

SIR,—Referring to the reproduction in your issue of December 8 of Mr. A. T. King's lecture to the Textile Institute on the "Fastness of Azo Colours to Sulphur Dioxide," the last paragraph states that "a more definite characterisation of fastness to sulphur dioxide on the part of colour makers . . . would make for a general improvement in efficiency and permanence of dyeing." We would draw your attention to the fact that this company has already published to their customers particulars of colours which are fast to sulphur dioxide in all proportions, and that this was acknowledged by Mr. King in the lecture referred to.—Yours faithfully,

(For the GEIGY COLOUR CO., LTD.),
FREDERICK L. GOODALL.
Technical Chemist.

Manchester, December 17, 1928.

British Steel Industry and Safeguarding

To the Editor of THE CHEMICAL AGE.

SIR,—Mr. R. Storry-Deans, M.P., speaking in London on the 4th inst., said that if 2,500,000 tons of the steel at present being imported were made in Britain, this would give employment to 100,000 extra workers, and would also mean the consumption of 8,000,000 more tons of coal. If these figures are correct, they explain why Britain is not competitive. Both figures are a long way higher than either the continental or American practice. Let me make a little calculation. The bulk of the 2,500,000 tons at present imported consists of steel billets, strips, bars, joists and plates the average price of which does not exceed £7 per ton delivered here, making a total of £17,500 000. Mr. Deans says if this steel were made in Britain the labour cost would be 100,000 men at £156 each, making a total of £15,600,000—that is nearly £6 per ton for wages only, leaving £1 per ton to cover cost of raw materials, on cost and overhead charges! When it is remembered that it only requires 1,250,000 tons of pig-iron (plus scrap) to produce the 2,500,000 tons of steel, the figure of 8,000,000 tons of coal is abnormally high.

If this is the case for safeguarding, then it has completely broken down. These alarming figures have been confirmed by the steel makers themselves in a printed leaflet issued recently on their behalf by the Empire Industries Association, London. They have also been confirmed by the President of the Board of Trade. If it costs £6 for labour and requires about four tons of coal to produce one ton of steel, then that is all the more reason why British consumers must have Free Trade. Britain has an export iron and steel trade at present of over 4,000,000 tons per annum. To retain this large export business she must have access to cheap sources of supply of the necessary raw and semi-raw materials.—I am, etc.,

DAVID MACMILLAN.

Glasgow, December 11, 1928.

Fire Extinction Conference

Need for Fire Protection Emphasised

A CONFERENCE arranged by the Association of Liquid Chemical Fire Extinguisher Manufacturers, took place on Tuesday, December 4, at the Institution of Mechanical Engineers, London. The chair was taken by Mr. A. E. Wiseman (The Pyrene Company, Ltd.), who was supported by Mr. S. G. Gamble, A.M.I.C.E., and by the following members of the council of the Association: Messrs. J. W. Blackman (The Valor Company, Ltd.), A. W. Cook (Minimax, Ltd.), Leonard Jones (Samuel Jones and Co., Ltd.), W. E. Ashley (J. Blakeborough and Sons, Ltd.), and C. T. Parfitt (Moneys Patents, Ltd.)

The chairman, in opening the conference, welcomed a large number of representatives from fire brigades, municipal authorities, important manufacturing concerns, and others interested in practical fire protection. He stated that this was the first meeting of its kind that had ever been held in this country. The council of his Association felt that nothing but good could come from the makers of fire appliances meeting the actual users face to face, with a view to a mutual understanding of their respective problems. During the first nine months of this year, the fire losses in this country amounted to about £8,000,000. This represented an increase of about £1,000,000 over the first nine months of 1926, and nearly £3,000,000 during the similar period in 1927. The manufacturers of fire appliances were doing a vast amount of research work in an endeavour to supply equipment to combat this menace to the prosperity of industry, and the conference had been organised with a view to co-operative action between themselves and the actual users of their appliances.

A Subject Requiring Attention

Mr. S. G. Gamble, who for 26 years was second in command of the London Fire Brigade, said that it was a challenging fact that insured property to the estimated value of forty to fifty million pounds sterling was destroyed by fire throughout the world every year. Despite this fact, it still had to be admitted that comparatively little attention was being paid in this country, which suffered about one-fifth of the world's fire loss, to the subject of fire prevention and fire protection. There were those who argued that the fact that property was insured renders the matter of fire protection of little account. Such arguments entirely overlooked the great loss to the community caused by a serious fire, and that in the long run, either directly or indirectly, the community paid.

To the public generally, as well as to those responsible for the maintenance of extensive business premises, the provision of efficient fire protection was a matter of first-class importance. In every scheme of fire protection, hand chemical fire extinguishers had their recognised place. The efficiency, ease of operation and handiness of these extinguishers was universally admitted. There were three distinct types of hand extinguishers: the soda and acid type (for dealing with fires of a general nature), foam or froth type (especially suitable for fires involving petrol, oil, etc., in bulk), and the carbon tetrachloride type (for petrol and oil and fires where electricity was involved.) Extinguishers of any of the types, properly charged in the first instance, and given the little care and attention they required, could be relied upon to do their work at any time.

Mr. Gamble gave some very interesting hints on the proper distribution of extinguishers, and strongly recommended that the workers in a building should be instructed in the use of the fire appliances, and that occasional opportunity should be afforded when the hand extinguishers could be operated on an improvised fire.

An A.B.C.M. Monthly Bulletin

THE Association of British Chemical Manufacturers is to be congratulated on the *Summary of Information on Chemical Trade*, which it has decided to issue monthly. The first number, for the month of November, contains 35 pages of interesting matter relating to the chemical industry—tables of trade statistics, classified extracts from the British and foreign press, and other practical information. The publication is very well produced and will be of considerable value for reference purposes.

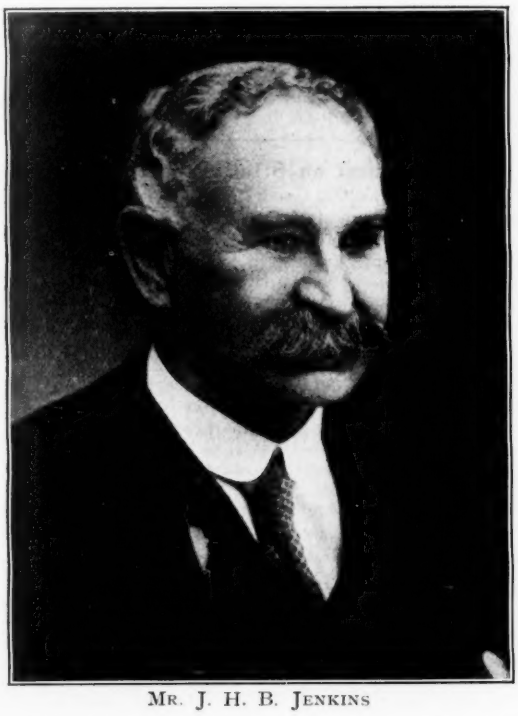
Death of Mr. J. H. B. Jenkins, F.I.C.

Chief Chemist to L.N.E.R. Co.

In reference to the death, on Tuesday, December 11, of Mr. J. H. B. Jenkins, F.I.C., chief chemist to the London and North Eastern Railway Co., a correspondent writes:

"Those who had the privilege of knowing Mr. Jenkins do not require any eulogium in his honour. By them he will always be remembered, and his life will still be to them, as in the past, a noble example. But there are many to whom Mr. Jenkins was known by name only, some of whom may read these lines and thereby catch something of the influence of his personality. In any case, it is fitting that some tribute, however humble, should be paid to his memory.

"I first met Mr. Jenkins nearly 30 years ago, and for the past 20 years have worked in close association with him, during which time the initial feelings of respect and admiration



Mr. J. H. B. Jenkins

—experienced immediately by everyone on making his acquaintance—deepened into real affection. These feelings have been shared by his staff and also by his colleagues on the Clearing House Committee of Railway Chemists and the many committees and conferences of railway officers, at whose service Mr. Jenkins's abilities were at all times most generously placed.

"Generosity was an outstanding quality of his nature, and he freely gave of his best in all that he undertook. No one could have been more painstaking and thorough in his work, and he devoted himself wholeheartedly and conscientiously to all the calls made upon him; moreover, ability and pleasantness were combined to a remarkable extent in Mr. Jenkins, together with an unfailing sense of humour.

"Of a naturally modest and unassuming disposition, he never desired or sought to command, yet so magnetic was his personality that all in his presence were instinctively attracted towards him, and he became an acknowledged leader whose counsel was always appreciated.

"Not only has the London and North Eastern Railway Co. suffered a heavy loss by his death, but so also have the others, as although he loyally served his own company, his knowledge, experience and sagacity were invaluable in the wider issues affecting the companies generally. His colleagues on the railway chemists' committee, and many others in the world of scientific and industrial chemistry, can testify to Mr. Jenkins's scientific qualifications, and all who knew him in the railway councils will remember him not only as a great chemist, but as a greathearted man, whose unselfish, helpful and kindly influence was at once a benediction and an inspiration.

"I am assured that in addition to the railway companies, many representatives of commercial firms, the Traders' Co-ordinating Committee and other trade organisations, who at times have had to contend with Mr. Jenkins, deeply regret his death, and whilst the traders recognise that the companies have lost a powerful and capable advocate, they too mourn the passing of one who at all times sought to be fair to them and was not unmindful of their point of view."

Our readers may remember a very able article on "Rail Transport as Applied to the Chemical Industries," which Mr. Jenkins contributed to The Chemical Age of March 31 last.

Anglo-American Finance Company

The Finance Company of Great Britain and America, Ltd. (of which Lord Melchett is chairman) have acquired the controlling interest in Humfrey-Sandberg (Sales) Ltd., which has been formed to develop the world rights of the Humfrey-Sandberg Freewheel and Easy Gear Change Device in motor cars and other engineering industries. The personnel of the Humfrey-Sandberg (Sales) Co. will include Captain John S. Irving, late Chief Engineer of the Sunbeam Motor Car Co., Ltd., and the company has secured the services of Mr. Alan Fenn, late of Humber, Ltd., as general manager. The company will have the advantages of the experience of Colonel The Master of Semphill, Mr. J. C. W. Humfrey the inventor, and Major H. O. D. Segrave, who, with the board of the Humfrey-Sandberg Co. have brought the inventions to the point of commercial development. A number of cars fitted with the Humfrey-Sandberg Freewheel and Easy Gear Change Device, are already on the road in regular use. The policy of the company is to place an efficient freewheel and easier gear change device at the service of every motorist, at a low price.

The resources of the companies with which the Finance Company of Great Britain and America, Ltd., is associated will be utilized in the technical and commercial development of these inventions. Operations on a commercial scale will commence early in 1929. The offices of Humfrey-Sandberg (Sales) Ltd., are at Transport House, Smith Square, S.W.1.

South Metropolitan Gas Co.'s "K.S.G." Plant

It was announced recently that an agreement had been concluded between Low Temperature Carbonisation, Ltd., and the South Metropolitan Gas Co., whereby the latter were to erect a plant for the production of "Coalite" by the British Parker system of low-temperature carbonisation. The plant is to be of a capacity of over 2,000 tons per week. It is now stated that a standard "K.S.G." low-temperature carbonisation retort, with a weekly throughput of 560 tons of coal, is also being erected by the South Metropolitan Gas Co., and is nearing completion. This is complete with cooling, condensing, and by-product plant, and, in addition, a producer gas generator to utilise coke breeze or other low-grade material to supply gas for heating the retort setting, leaving the rich gas free to be utilised for towns gas purposes.

Synthetic Rubber: Reported Marketing in Germany

Negotiations, it is reported, are pending between the Continental Caoutchouc and Guttapercha Co. in Hanover and the I. G. Farbenindustrie, relative to placing on the market synthetic rubber produced by the Trust. It would appear that the production of synthetic rubber has reached a stage which makes it a profitable commercial proposition.

The directors of the I. G. are very reticent as to the success attained in producing synthetic rubber on a commercial basis, but a statement that one of their members recently placed detailed information before a meeting of industrialists in the United States lends support to the supposition that great progress has been made in that direction.

Effects of After-Treatment

Action on Properties of Azo Colours

A MEETING of the Manchester Section of the Society of Dyers and Colourists was held on Friday, December 14, when a paper on the "Effects of after-treatments on the degree of aggregation, location, shade, and fastness properties of insoluble azo colours on the fibre" was read by Mr. Percy Bean, Junr., Ph.D., and Mr. F. M. Rowe, D.Sc., F.I.C. Mr. G. E. Holden presided.

The authors of the paper stated that microscopic comparison must be made only between fibres of similar structure, for a particular treatment gave diverse results with cotton hairs, for example, according to variations in the thickness of the cell walls of the hairs. Hairs of similar structure, however, no matter from what part of the material they were taken, usually contained the colouring matter aggregated and distributed in the same way. Aggregation and migration occurred more readily in viscose silk than in cotton. No two colouring matters were aggregated in a hair or fibre at the same rate or in exactly the same manner by a given after-treatment under the same conditions, although similar results might be brought about in each case by varying the severity or duration of the treatment.

Aggregation and Migration

Aggregation and migration, especially with azo compounds of β-naphthol, proceeded slowly even at the normal temperature and humidity of the air, as was proved by the examination of dyeings kept in pattern books for 20 to 40 years. Dry heat had very much less effect upon azoic colours on the fibre than moist heat at the same temperature, but dry heat at a sufficiently high temperature (250–300° C.) acted in the reverse direction and dispersed any visible pigment particles already present in the fibre.

Aggregation proceeded slowly in water at moderate temperatures, and more rapidly and completely at higher temperatures and increased pressures. Hot soap solution produced a similar effect more rapidly than water alone, and the outer surface of the fibres was usually more free from colouring matter owing to the removal of the aggregates by the solution. The same was true of alkali, or alkali and soap solutions.

Changes in Hue and Brightness

Aggregation and migration of azoic colours in the fibre were accompanied by changes in hue and brightness of the dyed material, and also by changes in the fastness to light, rubbing, and bleeding. The change in shade corresponded exactly with that anticipated from the degree of increase in the size of the pigment particles, while variations in the brightness, fastness to rubbing, and bleeding, depended upon the quantity of comparatively large pigment particles which remained collected on or near the surface of the fibres.

In searching for azo combinations to resist kier boiling, the ease of aggregation and migration of the colouring matter in the fibre was a reliable guide, for combinations which aggregated readily must bleed and mark off during kier boiling. The fastness to light increased with increase in the size of the pigment particles remaining in the fibre, irrespective of their location in it. Nothing was observed to support the view that the increased fastness to light might be due to driving the colouring matter into the interior of the fibres. In fact, the fastness to light increased with increased aggregation to the same extent on ordinary viscose silk as on cotton, yet in the former the migration of pigment was solely outwards. The increased fastness to light was due merely to decrease in the surface area of the colouring matter exposed.

Suitable After-Treatment

In actual practice, treatment with dilute soap solution, with or without sodium carbonate, at or near the boil for a short time appeared to be the most suitable general after-treatment for azoic colours on cotton. The object should be to remove loose surface pigment and to produce the first stage of aggregation within the cell wall, but to limit subsequent growth of the pigment particles and their migration as far as possible. This resulted in increased fastness to light, varying in degree with individual colouring matters, but with the minimum decrease in fastness to rubbing. Some change in hue usually indicated that the treatment had been sufficient, and it should then be stopped, as further treatment affected the fastness to rubbing adversely and caused undue loss of colouring matter from the fibre.

Any after-treatment of dyed artificial silks, except to remove loose surface pigment, was undesirable, because sufficient aggregation to produce a material increase in fastness to light, must result in blinding the lustre. Combinations should be selected for dyeing artificial silks which were not only sufficiently fast to light as they were produced in the fibre at first, but which also did not tend to aggregate appreciably in any hot soaping to which the dyed material might be subjected subsequently.

A point of especial interest was that azoic colours produced directly upon the fibre were normally regarded as faster to washing than ordinary water-soluble direct cotton dyes, because of the insolubility of the former in hot water, alkalis or soap solution, yet it was possible largely to remove pigments of this type from the fibre, in spite of their insolubility in the agents employed.

Other chemical classes of pigments also underwent aggregation in the fibre in proportion to the ease with which they crystallised. Indigo aggregated and migrated in the fibre more readily than many azo compounds, but anthraquinone vat dyes, sulphur dyes, etc., aggregated with very much greater difficulty.

Inquest on B.D.C. Worker

A VERDICT of "Accidental death" was returned at an inquest at Huddersfield on Thursday, December 13, on William Oddy, aged 43, chemical worker, of Paddock, Kirkburton. Oddy was overcome by fumes from a vat containing colouring matter at the Dalton works of the British Dyestuffs Corporation, Ltd., on the previous Monday, and he died the same day in Huddersfield Royal Infirmary. Ernest Albert Morris, of Kirkheaton, the charge hand of the department in which Oddy was employed, said Oddy had gone under the name of Shaw. On Monday he instructed Oddy to fill an earthenware jar with sulphuric acid. The jar was placed on top of a vat. Later witness saw fumes coming from the direction of the vat. He ran towards it, but collapsed. A tube connected the jar with the vat. The acid was not to have been released until a later stage in the process.

Another witness said he saw Oddy lying on the floor. He and his mate went to assist him but his mate fell, and a few seconds later witness tasted something sickly and collapsed.

Dr. Morley, chemist, of 7, Gledholt Street, said the bung had come out of the earthenware jar, with the result that the whole of the sulphuric acid had run into the vat, which contained sodium sulphide. Consequently about 40 cubic feet of sulphuretted hydrogen had been evolved. The jar method was to be superseded immediately by a new method.

It was stated that death was due to heart failure following asphyxiation consequent upon the inhaling of noxious gas.

"Some Notes on the Determination of Aluminium"

THE author of the above article, which appeared in the Metallurgical Section of THE CHEMICAL AGE on October 6, 1928, desires to state that the method of separating aluminium from beryllium by means of tannin, described in the last paragraph of the article, was originally due to the work of Professor Ludwig Moser and Dr. M. Neissner, of the Institute of Analytical Chemistry, Vienna, and is described by them in the *Monatshefte für Chemie* (Vol. 48, 1927, p. 113). Acknowledgment of this fact was inadvertently omitted from his article by the author, who much regrets the oversight.

I.C.I. and India

IN the course of an inquiry which is now being held by the Indian Tariff Board into the question of the protection of certain chemicals, evidence was given by Mr. Hughes, chairman of Brunner, Mond and Co. (India), Ltd., who denied that Indian manufacture had been adversely affected by the activities of I.C.I. He hinted that when the demand for certain chemicals in India was sufficient, his firm might, if the necessary raw materials were available, establish a factory in India, in which Indian capital would have an opportunity of participation.

The Dried Milk Industry

Dr. L. H. Lampitt on Developments

A LECTURE on "The Development of the Dried Milk Industry," with special reference to spray drying, was given by Dr. L. H. Lampitt, chief chemist to J. Lyons and Co., Ltd., at the second meeting of the session of the Birmingham and Midland Section of the Society of Chemical Industry, at the Chamber of Commerce, Birmingham, on Thursday, December 13. Mr. W. A. Calder presided.

Dr. Lampitt, in describing the development of the commercial drying of milk, said that its object was partly to overcome the enormous wastage due to souring, for which inadequate or inefficient milk transport was often responsible. Milk drying was also a practical attempt to conserve the surplus of milk in summer against winter needs. Production in summer was in excess of the demand for liquid milk, and, consequently, some was condensed or made into cheese, and quantities were given to cattle. Milk in dried form was invaluable in the bakery and the ice cream industry.

Requirements in Dried Milk

The requirements in dried milk were that it should retain the solids of fresh milk, be digestible, and that the powder could, by the application of a little water, be converted into a liquid which was indistinguishable from fresh milk. Chemistry had not achieved that quite, but nearly; we were, in fact, much nearer to that standard than the majority of people appeared to think. As to taste, appearance and flavour, milk powder, up to a certain age, would give a liquid which one could not differentiate from fresh milk. The reconstructed milk had practically the whole of the reactions of raw milk, chemical, physical and bio-chemical. In regard to vitamins, the contradictory statements in the literature of the subject seemed to be due to the fact that the investigations dealt with different milk powders. The effects of drying plants on the vitamin content and on the bio-chemical reactions varied considerably; the same remark also applied to the enzyme reactions and rennet tests. Roller-process powders gave a titration different from powders on spray drying plants.

Spray-Dried Products

The curve of spray powders coincided with that of raw milk, except that allowance must be made for the carbon dioxide normally present in raw milk which was partly lost during the process of drying. There was confirmation of his theory that spray drying, properly supervised with the correct pre-treatment of the milk, did not disturb the balance of the various constituents. As to the solubility of spray powders, the result was perfect if the particles were thoroughly wetted. The bacteria content could be brought very low by pre-treatment.

The roller-produced powder had better keeping properties than the spray-process powder. Rancidity was developed only by micro-organisms. A powder with more than 6 per cent .of moisture would deteriorate through the growth of micro-organisms, and that gave a rancid powder.

Discussion

Replying to the discussion, Dr. Lampitt stated that while it was true that the drying of milk in England would stop much waste, the stage of development of milk drying was such that it was economically unsound to dry milk.

Milk powder could be dried to a low percentage of moisture. The break in the curve was always between 6 per cent. and 8 per cent. of moisture. Spray drying had made enormous advances in respect of the maintenance of colour and flavour of milk. Light had an influence on deterioration. His experiments on the rate of deterioration gave the following order: no light, subdued light and sunlight. As to moisture content and rate of change of flavour, a powder with low moisture content would keep longer than one in which the moisture content was high.

Brown Coal Distillation

DR. J. HENKE, a Swiss expert in the distillation of oil from brown coal, has arrived in Australia, under engagement to the L. and N. Brown Coal Co., to examine the company's property at Morwell. For many years he was associated with this class of industry in Germany, and he expressed the view that there is a great future before the industry in Australia.

Chemical Industry Club Discussions

Mr. Davidson Pratt on Chemical Warfare

THE second of this session's informal discussions at the Chemical Industry Club, held on Monday evening, attracted a good attendance and resulted in an interesting and animated exchange of views. The discussion was opened by Mr. J. Davidson Pratt, general manager of the Association of British Chemical Manufacturers, with an address on "Problems connected with National Defence," in which he indicated the position with which the nation might be faced in another war, from the point of view of the defence of the civil population against chemical agents if used from the air. After outlining, in a non-alarmist manner, the nature of the menace, he suggested a possible scheme of defence, and indicated the need for careful organisation, and for the gradual education of the civil population in order that their present ideas regarding the effects of gas might be replaced by saner ideas of a less pessimistic nature. Professor Smithells and Professor Thorpe initiated a discussion in which about a dozen took part.

Commercial Espionage Allegations

AN astonishing story of the alleged attempts of the French Government to learn secrets of processes of the I.G. Farbenindustrie was told at Ludwigshaven court by Fritz Hellmann, one of four defendants to a charge of commercial espionage. Hellmann was a worker at the laboratories at Oppau, and said that on two occasions he had been approached by French officials who tried to induce him to betray secrets of the I.G. Refusing at first, he later agreed to supply information required. The French were supplied, he stated, with reports as to experiments on glycerine, phosgene and acetylene. He also supplied a report of experiments on lignite. Another of the defendants, Schwarzwaelder, when asked by the Bench whether he did not realise that he would have gravely injured German industry by revealing to foreigners methods of manufacturing synthetic benzine, replied: "There is no longer any secret in that. It is simply an international race between the big chemical trusts."

B.O.T. Report on Explosion

THE report of the preliminary inquiry into the explosion in an oil purifier at Lever Bros.' oil distilleries, Bromborough Port, on September 6 last, issued by the Board of Trade on Tuesday, states that the explosion was sufficiently violent to wreck the purifier. Excepting broken glass, no damage was done to the building. The consequent noise was described as a dull report. The explosion was caused by the benzine vapour outlet being obstructed by a closed valve, the safety valves being at the time inoperative. A pressure of benzine vapour and steam, greater than the shell of the purifier could withstand, was thus generated.

The engineer surveyor-in-chief, Mr. A. E. Laslett, in commenting on the report, states: "This explosion was caused through the safety valve, which was not of a suitable type, failing to act under the conditions for which the valve was specially provided." The owners were now having an improved arrangement to prevent over-pressure in the new purifier.

Dorman, Long and Low Temperature Carbonisation

SPEAKING at the annual general meeting of Dorman, Long and Co. at Middlesbrough on Tuesday, Sir Arthur Dorman said that with regard to the Betteshanger Colliery that had been developing a seam at a depth of 2,400 ft.; the quality of the coal was good. The peculiar circumstances of Kent and the quality of the coal made it a very suitable place to adopt low temperature carbonisation.

An exhaustive examination of the various processes, conducted by Dr. Roelofsen, their own technical adviser in matters of this kind, had induced Messrs. Pearson and Dorman, Long, Ltd., to adopt a process which was believed to be suitable for the quality of coal which occurred in that county. Plant for putting the process into operation was now being erected, and would, it was anticipated, be at work during the next twelve months.

However, it was not right to-day to say that low temperature carbonisation of coal was as yet, in his opinion, an assured economic proposition.

Scientific Research Company's Winding-Up.

Official Receiver's Statement

In the compulsory winding-up of Scientific Research, Ltd., of Brent Green Works, Hendon, London, the statement of affairs submitted by Robert Brownlow and Percy William Bullock, directors, on October 11, 1928, shows liabilities to unsecured creditors amounting to £3,408 and an estimated deficiency of £3,162. As regards contributors, the estimated deficiency is £13,662, the issued capital of the company amounting to £10,500.

History of the Company

According to the observations of the Official Receiver, Mr. E. T. A. Phillips, in a statement dated December 17, 1928, the company was incorporated on December 6, 1926, the nominal capital being £10,500, divided into 2,000 10 per cent. cumulative preference shares of £5, and 10,000 ordinary shares of 1s., to acquire the business of industrial chemists and engineers previously carried on by Robert Brownlow at the above address and elsewhere, under the style of Hendon Scientific Laboratories. The whole of the capital was issued for cash. The original directors were Robert Brownlow and Percy William Bullock. The former resigned on December 16, 1926, Arthur Pelham being appointed in his stead. Mr. Pelham did not acquire the necessary qualification, *e.g.*, the holding of 100 preference or ordinary shares.

Mr. Brownlow (continues the Official Receiver) was introduced in 1925 to Mr. Bullock, who began to finance various inventions due to the former. The tenancy of a works at Brent Green was taken, and the premises were equipped as a works and laboratory. Mr. Brownlow had meantime started trading as Hendon Scientific Laboratories. About £15,000 appears to have been found by Mr. Bullock, who was informed in November, 1926, that Mr. Brownlow was an undischarged bankrupt. In order to protect the assets of the business against Mr. Brownlow's previous creditors Mr. Bullock set about forming the company to take over the business of the Hendon Scientific Laboratories, and by an agreement dated December 6, 1926, the company acquired from J. E. Ward (acting as agent for Mr. Brownlow) the goodwill of the business of the Hendon Scientific Laboratories, the leases of the premises, plant, formulæ and processes, etc. The consideration for the sale was £10,250, which was paid to Mr. Brownlow.

On December 6, 1926, Mr. Brownlow applied for 2,000 preference and 5,000 ordinary shares, and Mr. Bullock for 5,000 ordinary shares, cheque being sent in payment, and the shares were allotted. The 2,000 preference shares, and 4,900 of the ordinary shares applied for by Mr. Brownlow, were allotted at his request to Mr. Bullock, who held them as trustee for certain persons who had provided finance for the business carried on by Mr. Brownlow as Hendon Scientific Laboratories prior to the formation of the company. On December 6, 1926, Mr. Brownlow was appointed general manager of the company for 10 years at a salary of £1,000 per annum.

Brownlow's Arrest

Shortly after the formation of the company, Mr. Brownlow was arrested and charged with having obtained £5,000 for the purpose of the business carried on by him without disclosing that he was an undischarged bankrupt, and sentenced to 12 months' imprisonment.

Mr. Bullock (continues the Official Receiver) stated that after the arrest of Mr. Brownlow, he decided, as a result of his investigations, to close down the business and dismiss the staff. Shortly afterwards, the Official Receiver at Bristol, as trustee in Brownlow's bankruptcy, took possession of the company's assets at Brent Green Works, and sold the same by auction. The statement of affairs was lodged on October 11, 1928.

As a result of statutory meetings of creditors and contributories held on October 16, 1928, the High Court of Justice appointed Mr. A. G. Cox, of 7, Duke Street, Adelphi, London, liquidator of the company, with a committee of inspection.

Chemical Matters in Parliament

Fuel Research

In reply to Mr. W. Thorne (House of Commons, December 12) Commodore King stated that the estimated net expenditure from public funds at the Fuel Research Station during the current financial year was £54,500.

In reply to a question by Sir R. Thomas, Commodore King stated that the latest information did not indicate that commercial success had yet been attained in the hydrogenation of coal and coal tar.

Low Temperature Carbonisation

Mr. W. Thorne (House of Commons, December 13) asked the Secretary for Mines what portion of the £2,000,000 guarantee to Messrs. Pearson and Dorman Long for the development of the Kentish coalfields had been spent on the erection of low-temperature carbonisation plant at the Snowdown Collieries, Kent; what monetary advantage the Government were likely to receive arising from the transaction; and the prices per ton of low-temperature carbonisation fuel manufactured by the Illingworth Carbonisation Co., the Coalite Co., and Messrs. Pearson and Dorman Long?

Commodore King, in a written answer, stated that he had no knowledge in regard to the first two parts of the question, which should be addressed to the Chancellor of the Exchequer. As regards the last part of the question, delivered prices of low-temperature carbonisation fuels varied according to district. He had no information about prices at works, as it is not usual to ask any firm to supply contract prices for purposes of publication.

Safeguarding Duty on Phosphate of Lime

Major Owen (House of Commons, December 14), asked the Chancellor of the Exchequer whether he was aware that a consignment of crude precipitated phosphate of lime, a by-product of gelatine manufacture, which was landed at Grimsby on August 27 last, was detained by H.M. Customs on the plea that it was liable to Key Industry Duty; that the importing firm had made representations to H.M. Customs and had produced evidence to show that the consignment consisted solely of a crude raw material not coming within the category of purity to which the duty applied; that up to the present the matter had remained under the consideration of the Department; that no definite decision had been given, and that the consignment was still being detained and the British manufacturing firm hampered in the carrying on of its industry; and whether the decision in this case could be expedited and the consignment released without further delay?

Mr. Samuel, in a written reply, stated that a decision had now been arrived at that the material in question must be regarded as liable to duty under Part I of the Safeguarding of Industries Act, 1921. The importers had been informed accordingly. The delay in reaching a decision was due to the necessity for a careful investigation and consideration of the facts of the case. He added that immediate delivery of the consignment in question could have been obtained by the importers at any time, on a deposit being made to cover any duty which might prove to be payable.

Dead Sea Salts

In reply to Col. Howard Bury (House of Commons, December 17), Mr. Amery stated that before the war the Turkish Government was alleged to have granted a concession for the extraction of certain substances from the Dead Sea. From time to time His Majesty's Government had been requested to recognise this concession, but being advised that they are under no legal obligation to do so, have consistently declined to recognise it.

Increased Canadian Production of Natural Gas

The production of natural gas in Canada during the year 1927 showed an increase of 11·3 per cent., the revised figure just published by the Dominion Bureau of Statistics at Ottawa being 21,376,791 thousand cubic feet, worth $8,043,040. Canada's commercial production of natural gas comes from four provinces, Alberta leading with an output of 13,434,621 thousand cubic feet, valued at $3,586,533. Ontario had an output of 7,311,215 thousand cubic feet, valued at $4,331,750, and New Brunswick 630,755 thousand cubic feet, valued at $124,637. Manitoba also appears in the Government statistics with 200 thousand cubic feet, valued at $60.

From Week to Week

SIR WILLIAM H. BRAGG, president of the British Association, delivered a lecture on "Science in Industry" last week, at the University College, Swansea.

BROMINE is now being manufactured by the Italian company, Societa Italiana del Broma, at Margherita di Savoya. The daily production is 130-150 kg.

A CONSIGNMENT of 500 tons of uranium ore was shipped from Fowey for Rangoon, last week. The ore was raised near St. Stephens, in the neighbourhood of St. Austell.

THIRTY-FIVE PERSONS were injured on Tuesday in a fire which destroyed a cellulose factory near Berlin. It is feared that some lives may have been lost and the bodies buried under the ruins.

THE RUMOUR THAT Dr. G. C. Clayton, a director of I.C.I., is not likely to seek re-election to Parliament has been denied by the Conservative agent of Widnes, which Division Dr. Clayton represents.

THE MANAGERS OF THE Edinburgh Royal Infirmary have approved of the establishment of a Radium Institute, the first in Scotland, for the treatment of patients suffering from cancer and other conditions amenable to radium.

THE ENGLISH STEEL CORPORATION, LTD., has been registered to acquire and amalgamate certain departments of the undertakings, works, properties, and assets of Vickers, Ltd., Vickers-Armstrong, Ltd., and Cammell Laird and Co., Ltd.

THE PRESIDENT of the British Chemical and Dyestuffs Traders' Association, Mr. Victor Blagden, has conveyed his thanks to the menbers of the Association for their kind expression of appreciation in presenting him with a water-colour drawing by Birket Foster.

BETWEEN SEPTEMBER 1 and December 1, states a Moscow message, the Chiatury Manganese Trust exported a total of 50,288 tons of manganese. This was exported to the following countries: America, 36,346 tons; Germany, 3,909 tons; Italy, 7,230 tons; France, 1,200 tons, and England, 1,503 tons.

MR. G. MARSDEN has intimated to the board of the Continuous Coal Carbonisation Co. that, as the plant at Erith has now been completely reconditioned and is on the point of productive operation, he is resigning his directorship. His resignation, he states, is in no way connected with, or occasioned by, a recent attack on the company in a circular addressed to the shareholders.

ARTIFICIAL SILK NEWS.—Courtaulds have decided to erect an extensive plant for the manufacture of artificial silk in Poland. The site has not yet been disclosed.—Arrangements have been made with the Montecatini Company and the French Rhodiaseta for the formation of an Italian company for the manufacture of acetate silk under Rhodiaseta patents. The factory will be erected on Lake Maggiore.

A JAPANESE INVESTIGATOR, Mr. M. Imatomi, has carried out some experiments of producing cementation of electrolytic iron with a mixture of benzol and nitrogen at temperatures up to 850° C. By passing a current of the mixture over the incandescent iron at the rate of 1,000 cubic cm. per hour for one, two and three hours respectively, he increased the weight of the specimen by 1.7 per cent., 2.4 per cent., and 3.2 per cent. respectively.

OGILVY AND CO., scientific instrument makers and dealers, of 20, Mortimer Street, London, have issued a catalogue of shop-soiled and second-hand apparatus and instruments at reduced prices, including microscopes, photomicrographic apparatus, haemotological apparatus, photographic cameras, field glasses, scientific publications and microscope accessories. The firm announces that it is discontinuing its second-hand department and desires to dispose of second-hand stock in the shortest time, in which circumstances special discounts are offered.

OFFICIAL INFORMATION reaches us that the interests controlling the United Cigar Stores system and the Whelan Drug Co., one of the largest operators of drug stores in America, have concluded arrangements to add to their huge organisation a chain of 67 stores operated by the Neve Drug Stores Inc., another famous chain store system. Indications that the scheme will be approved have already been received from a substantial number of the larger shareholders of the Neve Drug Stores, who have agreed to deposit their stock with the Equitable Trust Co. for conversion purposes.

WITH THE OBJECT of placing their factory workers in the same position as their clerical staff, Lever Brothers, Ltd., will bring into operation, in the New Year, various concessions to workers who have attained the age of 22 years and have completed four years at December 31 in any year. These new privileges include extra payment for employees on short time more than four and a half hours each week; unemployment benefits; sickness benefits; accident benefits and a special rate of payment for shift workers. The benefits are to be made payable for periods up to thirteen weeks on a scale that, together with benefits from other sources, will allow the worker an amount equal to a full week's wage less four and a half hours except in certain unemployment cases when the total sum will be equal to three quarters of a week's wages.

DAMAGE TO THE EXTENT of £3,000 was caused by a boiler of tar upsetting and starting a fire at the Norton Lime Works, tar macadam manufacturers, Mumbles, near Swansea, last week.

AT LEAST four persons are dead, six injured and fifteen missing as the result of an explosion at the premises of the Killall Disinfectant Co., Upper East Side, New York recently.

AN OUTLINE of the history of iron production was the subject of a lecture by Professor D. Hanson, Professor of Metallurgy of Birmingham University, at the Technical Institute, Middlesbrough, on Monday.

DR. GORDON PARKER will, at the request of the Egyptian Ministry, undertake an investigation of the Egyptian leather industry and will prepare a report on the industry including suggestions for reorganisation on modern lines.

ETABLISSEMENTS BERGIS-STURM, chemical manufacturers, of 31, Rue des Francs Bourgeois (IVe), Paris, announce that they have changed their name to Société Anonyme des Anciens Etablissements Sturm. Telegraphic address: Mruts–82, Paris.

UNIVERSITY NEWS.—*Glasgow:* Professor Andrew Hunter, of the University of Toronto, has been appointed Gardiner Professor of physiological chemistry in Glasgow University.—*London:* The D.Sc. in biochemistry has been conferred upon Mr. W. Robson, of King's College.

THE BETHLEHEM STEEL CORPORATION and the Universal Mill Co. are suing the United States Steel Corporation, alleging infringement of five patents in the manufacture of steel beams and grids, charging the Corporation with having used patents which produced $250,000,000 of materials, and demanding the accounting of treble damages.

DR. F. A. FREETH, F.R.S., of Imperial Chemical Industries, is to deliver two lectures on "Critical Phenomena in Saturated Solutions," at the Royal Institution, London, the first taking place on Tuesday, January 15, at 5.15 p.m. Among those who will deliver Friday evening discourses at the Institution during 1929 are: Dr. E. K. Rideal, Sir Robert Robertson, and Professor V. M. Goldschmidt.

THE HOME SECRETARY has made new regulations under the Dangerous Drugs Act, to come into operation on January 1. On and after that date, the following drugs, in addition to those already controlled, can only be dealt in by persons licensed or authorised: coca leaves; Indian hemp (including the resins, extracts, and tinctures); preparations containing less than 0·1 per cent. of diacetylmorphine (heroin). Applications for licenses should be made to the Under Secretary of State, Home Office, London.

A DEMONSTRATION was given at Slough, on Thursday, December 13, of the methods employed by the Dvorkovitz system of low-temperature carbonisation, with which experiments are being conducted by the Rational Carbonisation Syndicate, Ltd. Dr. Paul Dvorkovitz states that thirty gallons of oil can be obtained from one ton of coal, leaving a good domestic fuel, while the oil may be used for lighting, power and lubrication. Mr. A. E. Faulkner, Acting Permanent Under Secretary for Mines, was among those present at the demonstration.

ACCORDING TO THE SOVIET ANILINE TRUST'S programme for 1928–29 the production was to be raised by 37 per cent. The proposals are being reconsidered and the output of nearly all products is to be increased with the exception of sulphur black dyes and aniline oil. Acid dyes are to be increased by 66 per cent., sulphur colours by 49 per cent., substantive dyes by 15 per cent., and basic dyes by 40 per cent. It is proposed also to manufacture induline, high percentage oleoline, accelerators for rubber. Seven new intermediates will also be made.

AT AN INQUEST held at Deptford on a coke loader, employed by the South Metropolitan Gas Co., who was killed while at work at Thames Street Wharf, Greenwich, the Chief Mechanical Engineer, Mr. Robert Macdonald, stated that in the case of every accident the company held an inquiry similar to that held by the coroner. The engineer in charge of the station, Mr. Macdonald said, presided, and twelve employees were chosen to serve as a jury. In the case of a fatal accident the chairman of the company presided. After all possible evidence had been heard, the jury were asked to decide whether the accident was due to negligence on the part of the employee, want of foresight on the part of the company, or faulty materials.

MR. S. M. FULTON, of the British Celanese Co., of Spondon, addressed the Manchester Athenæum Textile Society last week on the subject of "Artificial Silk Yarns and Fabrics." Mr. Fulton, who is a B.Sc. of London University, was a research chemist at Armstrong Whitworth's in Openshaw, and subsequently to the motor trade, before he entered the research department of British Celanese. "Development always follows research," was one of his claims. He also said that the textile trade had suffered from lack of courage among its leaders, and of co-operation between producers and merchants. His company had established an organisation to place at the disposal of the trade the benefit of its experience in weaving, dyeing, and finishing. There was no reason, he suggested, why Paris should lead London and Lancashire if British textile manufacturers had ideas and foresight.

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CATALYTIC HYDROGENATION.—Catalytic hydrogenation under reduced pressure. II.—Selective reduction in vacuo of citral, geraniol, and limonene. R. Escourru. *Bulletin Société Chimique France*, November, pp. 1204–1214 (in French).

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Researches on the reactions between nitrogen peroxide and sulphur dioxide. E. Briner, G. H. Lunge and A. van der Wijk. *Helvetica Chimica Acta*, Vol. XI, Part 6, pp. 1125–1144 (in French). In the liquid phase (that is, under high pressure) a substance $S_2N_2O_5$ is formed. Under ordinary pressure, in the gaseous phase, reaction is rather slow at low temperatures; at high temperatures the reaction takes a course different from the above.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

300,402. Potassium Compounds Free from Chlorine, Manufacture of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application dates, December 3, 1927, and August 18, 1928.

A fertiliser containing nitrogen and potassium is obtained by treating solid potassium bisulphate with gaseous ammonia. The product is a dry powder which does not agglomerate, is odourless, and contains no ingredients injurious to plants. The potassium bisulphate may be obtained by passing a current of superheated steam through a mixture of potassium chloride and sulphuric acid at a temperature below 120° C. Examples are given.

300,407. Dyestuffs of the Anthracene Series, Process of Manufacture of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, December 9, 1927.

These dyestuffs are obtained by condensing α or β-hydroxy compounds of anthracene with α-naphthoquinones substituted in the 2- and 3- positions by negative substituents of which at least one is a halogen atom. The products can be employed as pigments and vat dyestuffs, and can also be converted into other dyestuffs. Examples are given of the condensation of α- and β-anthrol with 2:3-dichlor-α-naphthoquinone, 1:5-anthradiol (rufol), or 1:8-anthradiol (chrysazol), with 2-3-dichlor-α-naphthoquinone, α-anthrol with nitro-2:3-dichlor-α-naphthoquinone or 2-chlor-3-acetoxy-α-naphthoquinone.

300,432. Vat Dyestuffs, Production of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 1, 1928.

2:2¹-dibenzanthronyl and its derivatives are halogenated to obtain the tetrahalogen compounds, which are then heated with amino-anthraquinones, preferably with the addition of alkaline or other substances which combine with acids, and compounds of copper or other metals. Vat dyestuffs are obtained by this reaction, although the corresponding reaction with mono- and dihalogen-2:2¹-dibenzanthronyls ceases with the formation of the anthraquinonyl-amino-2:2¹-dibenzanthronyls, which have to be treated with alkalies to obtain dyestuffs. Examples are given.

300,603. Electrolysis of Brine. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, August 16, 1927.

In the electrolysis of brine the presence of calcium and magnesium salts is a disadvantage, since the mercury takes up calcium and magnesium in the form of amalgams and hydrogen is then liberated. In this invention, the calcium and magnesium salts are precipitated by adding sodium fluoride. The completeness of the precipitation is not influenced by the acid reaction or the chlorine content of the brine, and the small proportion of sodium fluoride present in the solution does not affect the working of the cell.

300,594. Dyestuffs of the Pyrone Series, Manufacture of. K. and K. S. Carpmael, London, and I.G. Farbenindustrie Akt.-Ges, Frankfort-on-Main, Germany. Application date, June 16, 1927. Addition to 247,003.

The dyestuffs of the pyrone series which are prepared according to Specification No. 247,003 (see The Chemical Age, Vol. XIV, p. 253) contain some secondary products which in this invention are removed by means of the difference in solubility of their salts from the salts of the pyrone dyestuffs. In an example, the dyestuff acid obtained from 2 : 6-dichlorobenzaldehyde and 2 : 4-dioxy-3-methyl-benzoic acid is dissolved in sodium carbonate solution and treated with common salt till no further separation of the sodium salt takes place. The latter is a dark red powder difficultly soluble in water, which dyes wool in an acid bath in much clearer shades than the crude product. The filtrate from the sodium salt can be precipitated by mineral acid to obtain a brown dyestuff acid. Other similar dyestuffs may be treated in the same manner.

300,683. Green Vat Dyestuffs of the Anthraquinone Series, Manufacture of. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, August 17, 1927.

These dyestuffs are obtained by the action of hydrazine on an aroyl-amino-1 : 2 : 5 : 6-diphthaloyl-acridone or a derivative substituted in the aroyl group, particularly the benzoylamino-1 : 2 : 5 : 6-diphthaloyl-acridone or a derivative substituted in the benzoyl group such as can be obtained as described in Specification No. 295,645 (see The Chemical Age, Vol. XIX, p. 266). These dyestuffs are also obtainable by treating monoamino-1 : 2 : 5 : 6-diphthaloyl-acridone with hydrazine and treating the product with aroyl-halogenides. Examples are given of the treatment of monobenzoyl amino-1 : 2 : 5 : 6-diphthaloyl-acridone, mono orthochloro-benzoylamino-1 : 2 : 5 : 6-diphthaloyl-acridone, and monometa-methoxy-benzoyl-amino-1 : 2 : 5 : 6-diphthaloyl-acridone with hydrazine hydrate; and monoamino-1 : 2 : 5 : 6-diphthaloyl-acridone with hydrazine hydrate, and the product with benzoyl chloride. The products are green vat dyes.

300,695. Basic Ethers of Resorcinol, Manufacture of. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, August 18, 1927.

Dialkyl ethers of resorcinol having an amino-alkyl residue are obtained by the interaction of saturated monoalkyl ethers of resorcinol with amino-alkyl halogenides in the presence of alkaline acting media. Examples are given of the treatment of resorcinol mono-methyl-ether with a solution of sodium in alcohol, and then with diethyl-amino-ethyl chloride or with α-dimethyl-amino-β-methyl-γ-chlorobutane. These products are used for therapeutic purposes.

300,703. Destructive Hydrogenation of Carbonaceous Materials. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, August 11, 1927.

Catalysts for the hydrogenation of coal, tars, mineral oils, distillation, extraction, and conversion products at high temperature and pressure, consist of boron, silicon, titanium, vanadium, tantallum, molybdenum or tungsten, either free or combined, or cobalt in a combined state, together with not more than 10 per cent. of copper and zinc (or cadmium) either in a free or combined state. The pressure is above 50 atmospheres and the temperature above 400° C. A large excess of hydrogen is employed or mixtures or compounds containing hydrogen may be used. The apparatus is preferably composed of, or lined with aluminum or steel alloys. The carbonaceous material is exposed in thin layers on porous supports, through which the hydrogenating gas passes, or the liquid material may be sprayed into the gas.

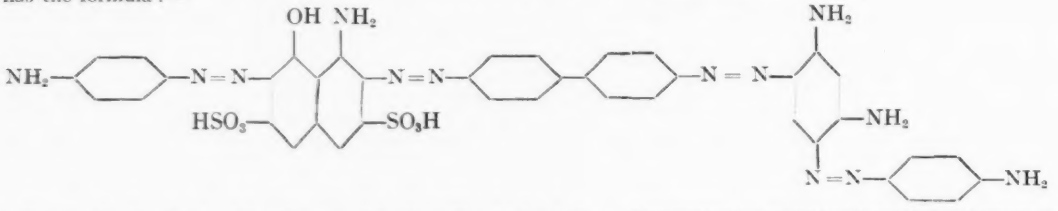
300,719. Raw Rubber from Rubber Latex, Production of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application dates, August 27 and September 15, 1927.

Rubber is coagulated from the latex by treatment with proteases in the presence of additional substances which promote the activity of the proteases, *e.g.*, hydrocyanic acid, hydrogen sulphide, or saline mixtures possessing buffer properties, such as citrates. Latex which has been stabilised by ammonia may also be coagulated in this manner if the ammonia is removed by an air blast or by neutralisation. Suitable proteases are those found in Succus caricæ papayæ, and the coagulation takes place in a few hours. This process has the advantage that the valuable associates are also precipitated from the latex, and washing can be dispensed with. Tough white rubber can be obtained from Hevea brasiliensis. The properties of the rubber can be improved by retarding the coagulation of the latex by imparting to it

a p_h rising from 7·5 to 8·5-9, or accelerating the coagulation by adjusting a p_h decreasing down to about 6. Different grades of rubber are thereby obtained. If saline mixture such as citrates are also present during coagulation the products do not tend to become viscous.

300,722. BLACK TETRAKISAZO DYESTUFF, MANUFACTURE OF. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, August 29, 1927.

A black tetrakisazo dyestuff is obtained from the disazo dyestuff obtained from one molecular proportion of the tetrazo compound of benzidine by acid coupling with one molecular proportion of 1-amino-8-naphthol-3 : 6-disulphonic acid, followed by alkaline coupling with one molecular proportion of *m*-phenylene-diamine. This disazo dyestuff is treated with two molecular proportions of the diazo compound of *p*-amino-acetanilide, and the resulting tetrakisazo dyestuff subjected to saponification in alkaline medium. The dyestuff has the formula :—



It can also be obtained by the use of *p*-nitraniline instead of *p*-amino-acetanilide, in which case the dyestuff is subjected to reduction instead of saponification. The dyestuff gives greenish-black shades on chrome leather, without the addition of any other dyestuff.

300,771. 1 : 8-NAPHTHOXYPENTHIOPHEN COMPOUNDS, MANUFACTURE OF. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 25, 1927.

When 1 : 8-naphthoxypenthiophen is obtained by alkali fusion of 1 : 8-naphthothioglycollic carboxylic acid, or by heating the acid with acetic anhydride, the yield and purity are poor. In this invention, a good yield of the pure product is obtained by heating 1 : 8-napthothioglycollic carboxylic acid or a nuclear substitution product in aqueous solution or suspension in a closed vessel to 150-200° C. An electrolyte such as sodium chloride is preferably added. Examples are given.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—276,350 (Azogeno Soc. Anon. per la Fabricazione Dell' Ammoniaca Sintetica e Prodotti Deravati. C. Toniolo and B. Tanzi) relating to non-hygroscopic salt from calcium nitrate, see Vol. XVII, p. 373 ; 280,574 (W., K., L., W. and F. Merck) relating to aryl-aminoalkyl carbinols, see Vol. XVIII, p. 85.

International Specifications not yet Accepted

298,640. NAPHTHALENE DERIVATIVES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, October 13, 1927.

A suspension of 1 : 1^1-dinaphthylene-2 : 8^1:8 : 2^1 dioxide in 25 per cent. sulphuric acid is oxidised by potassium bichromate apparently to the 4:4^1-quinone, which gives a yellow leuco compound with alkali hydrosulphite.

298,889. SYNTHETIC RUBBER. J. Baer, 723, Greifenseestrasse, Uster, Switzerland. International Convention date, October 15, 1927.

Formaldehyde is treated with alkali or alkaline earth polysulphides in solution. The formaldehyde may be mixed with ethylene or methylene dichloride or dibromide. The products resemble rubber.

298,907. DYES. O. Y. Imray, London. (Assignee of I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany.) International Convention date, October 13, 1927. Addition to 296,473. (See THE CHEMICAL AGE, Vol. XIX, p. 322.)

Azo dyes are obtained by coupling a diazotised 2 : 5-dimethyl-4-halogenaniline with an arylide of 2 : 3-oxynaphthoic acid or an arylide of a β-keto-carboxylic acid. Red shades are obtained on cotton, fast to chlorine.

298,939. HYDROCARBON RESINS. P. Krishnamurthy, P-83/B, Haldapara Road, Kalighat, Calcutta. International Convention date, October 17, 1927.

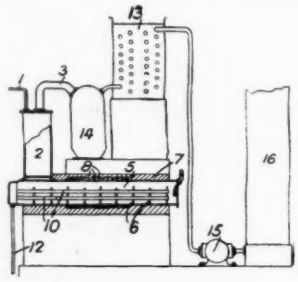
A substitute for shellac is obtained by chlorinating toluene in the presence of sunlight or a catalyst, dissolving the product in carbon disulphide, adding a small proportion of zirconium tetrachloride, mixing the reddish-brown liquid obtained with water, and treating with steam.

298,942. VULCANISING RUBBER. Goodyear Tire and Rubber Co., 1144, East Market Street, Akron, Ohio, U.S.A. (Assignees of J. Teppema, 29, Mayfield Apartment, Twin Oaks, Akron, Ohio, U.S.A.) International Convention date, October 17, 1927.

Vulcanisation of rubber is accelerated by the use of mercapto-benzoxazole or mercapto-naphtoxazole or their derivatives.

298,894. NITRIC AND SULPHURIC ACIDS. A. Schmid, 3, Heumühlgasse, Vienna, and J. Meissner, Burbach, Westfalen, Kreis Siegen, Germany. International Convention date, October 15, 1927.

Sulphuric acid containing nitric acid is heated in vacuo so that most of the nitric acid is separated before a temperature is reached at which organic substances are acted upon. The remaining nitric acid is removed by reaction with the organic substances, leaving pure sulphuric acid. The acid passes by a pipe 1 to a dephlegmator 2, and thence to a horizontal still 5 having baffles 6, and heated by an electric heater 8



298,894

at its middle portion. The heated acid flows back through pipes 10 to heat the incoming acid. Nitric acid vapour passes through the dephlegmator 2 and cooler 13, and condensate collects in a vessel 14, while nitrogen oxides pass to tower 16. A vacuum of 190–200 mm. is maintained, and the acid reaches a temperature of 120° C. on leaving the zone 8, and 145°–150° subsequently.

298,955. DYE INTERMEDIATES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, October 17, 1927.

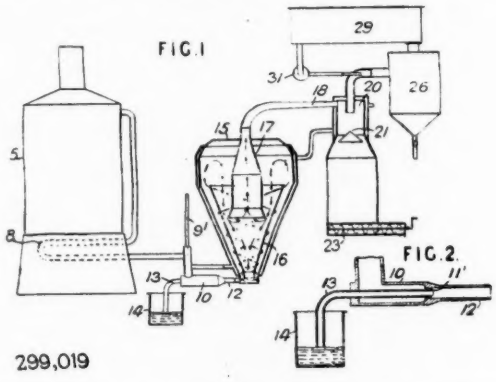
Thioglycollic acids of the benzene series having a CN, COOH, or COO metal group in the 2-position, an alkyl group in the 3-position, and a halogen atom or an alkyl group in positions 4, 5 and 6, are heated under pressure with water to obtain oxy-thionaphthenes. Suitable thioglycollic acids include 3-methyl-5-chlorphenyl-1-thioglycollic-2-carboxylic acid, 3 : 6-dimethyl- 5-chlorphenyl-1-thioglycollic-2-carboxylic acid, 2-cyano-3-methyl-5-chlorphenyl-thioglycollic acid, and 2-cyano-3 : 6-dimethyl-5-chlorphenyl-thioglycollic acid.

298,972. ESTERS OF RESIN ACIDS. Hercules Powder Co., 900, Market Street, Wilmington, Del., U.S.A. (Assignees of A. C. Johnson, Kenvil, N.J., U.S.A.) International Convention date, October 18, 1927.

A resin acid such as abietic acid, or a resin containing pimaric acid is treated with ethyl or amyl chloride, or ethyl or butyl bromide in the presence of alkali, preferably in alcoholic solution. Some examples are given.

299,019. HYDROCYANIC ACID. California Cyanide Co., Inc., 342, Madison Avenue, New York. (Assignees of P. T. Dolley, Box 250, Arcade Station, Los Angeles, U.S.A.) International Convention date, October 19, 1927.

Steam from a boiler 5 and superheater 8 is mixed with carbon dioxide or sulphur dioxide from a pipe 9 and passed through an injector 10, where it draws in powdered cyanide from a container 14. The mixture passes into a reaction chamber 15 and passes upwards between the wall and a



299,019

conical baffle 16 and then downwards between baffles 16, 17 and upwards through pipe 18 to separator 20. Solid particles fall past a baffle 21 and are discharged by a conveyor 23, and hydrocyanic acid gas passes through a cooling chamber 26 to a chamber 29. The powdered cyanide used may be obtained by melting calcium cyanide with sodium chloride.

299,020–1. DESTRUCTIVE HYDROGENATION. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, August 7, 1926.

299,020. Catalysts for the destructive hydrogenation of carbonaceous materials consist of boron, silicon, phosphorus, arsenic, selenium or tellurium preferably in conjunction with elements of the 6th group.

299,021. Catalysts are employed containing halogens, preferably in conjunction with elements of the 6th group.

299,048. ACETONE. I.G. Farbenindustrie, Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, October 21, 1927.

Acetylene and steam are passed over metals or compounds, the acetates of which metals yield acetone when heated. The rate of flow of the gases is lower than that which yields acetaldehyde as the main product. The acetone is separated in a column still or dephlegmator. A number of catalysts are specified, including zinc, tin, aluminium, or magnesium oxides, carbonates, or acetates, or the metals themselves.

LATEST NOTIFICATIONS.

301,859. Solvent treatment of copper silicate ores. Anglo-American Corporation of South Africa, Ltd. December 7, 1927.
302,142. Accelerator of vulcanisation. Goodyear Tire and Rubber Co. December 10, 1927.
302,143. Accelerator of vulcanisation. Goodyear Tire and Rubber Co. December 10, 1927.
302,144. Antioxidant or age-resister. Goodyear Tire and Rubber Co. December 10, 1927.
302,147. Manufacture of rubber or rubber-like material. Goodyear Tire and Rubber Co. December 10, 1927.
301,796. Carbonising and burning of bituminous fuel. Humphreys and Glasgow, Ltd. December 5, 1927.
302,148. Process for the production of a complete fertiliser. Chemieverfahren Ges. December 10, 1927.
301,864. Künstdunger-Patent-Verwertungs Akt.-Ges.
301,864. Method of leaching raw phosphate. Künstdunger-Patent-Verwertungs Akt.-Ges. December 7, 1927.
301,798. Process for the manufacture of condensation products. Künstharzfabrik Dr. F. Pollak Ges. December 5, 1927.
302,151. Manufacture of rubber composition. Rubber Latex Research Corporation. December 10, 1927.
301,898. Manufacture of divinyl and homologues thereof. I.G. Farbenindustrie Akt.-Ges. December 9, 1927.
301,799. Catalytic apparatus. Selden Co. December 5, 1927.
301,907. Distillation of fine granular material. Trocknungs-Verschwelungs-und Vergasungs-Ges. December 9, 1927.
301,802. Moulds for vulcanising rubber. Voshage, A. December 5, 1927.
301,805. Process of producing stabilised dispersions. Naamlooze Vennootschap De Bataafsche Petroleum Maatschappij. December 5, 1927.
301,806. Catalytic preparation of oxygenated organic compounds. Du Pont De Nemours and Co., E. I. June 12, 1926.
301,807. Manufacture of waterproof paper or pasteboard. I.G. Farbenindustrie Akt.-Ges. December 5, 1927.
301,808. Manufacture of 4-(β-oxvethylamine)-1-oxybenzene. I.G. Farbenindustrie Akt.-Ges. December 5, 1927.
301,845. Manufacture of the meta-amino-benzoyl derivatives of dimethyl-amino-pentanol. Soc. Des Usines Chimiques Rhone-Poulenc. December 6, 1927.
301,878. Cellulosic material. Soc. Industrielle D'Applications Photographiques Soc. Anon. December 7, 1927.
301,883. Ozone generators. Fery, C. J. V. December 7, 1927.
302,171. Manufacture of 4-chloro-1-aminoanthraquinone-2-sulphonic acid. I.G. Farbenindustrie Akt.-Ges. December 8, 1927.
302,172. Fire-preventing and fire-extinguishing agents. I.G. Farbenindustrie Akt.-Ges. December 10, 1927.
302,173. Manufacture of azo dyestuffs. I.G. Farbenindustrie Akt.-Ges. December 10, 1927.
302,174. Process for concentrating aqueous acetic acid. I.G. Farbenindustrie Akt.-Ges. December 8, 1927.
302,175. Manufacture of hydroxy-thionaphthenes. I.G. Farbenindustrie Akt.-Ges. December 8, 1927.
302,176. Processes for vulcanising rubber and products obtained thereby. Naugatuck Chemical Co. November 1, 1926.
302,178. Process for the manufacture of chromium oxide. I.G. Farbenindustrie Akt.-Ges. December 10, 1927.
302,184. Production of light-sensitive layers by means of diazo compounds. Kalle and Co. Akt.-Ges. December 10, 1927.

Specifications Accepted with Date of Application

275,271. Amidated sulphurised benzanthrone derivatives, Manufacture of. I.G. Farbenindustrie Akt.-Ges. August 2, 1926.
275,273. Hydrogen, Method of producing. F. Gulker. July 30, 1926.
276,658. Separating paraffinaceous constituents and the like from oils, Method of and apparatus for. Aktiebolaget Separator-Nobel. August 24, 1926.
276,687. Purifying hydrogen and gases containing hydrogen Gewerkschaft der Steinkohlenzeche Mont Cenis. August 30 1926.
277,974., 279,055, 279,410. Splitting hydrocarbons, coal, and its distillation products. A. L. H. Spilker, C. Zerbe, and Ges. für Teerverwertung. September 23, October 18 and October 23, 1926. 279,055 and 279,410 additions to 277,974.
279,136. Aromatic mercaptans, Manufacture of. I.G. Farbenindustrie Akt.-Ges. October 18, 1926.
283,105. Hydrocarbons poor in hydrogen, Manufacture of. I.G. Farbenindustrie Akt.-Ges. January 3, 1927.
283,927. Aluminium alloys. T. Goldschmidt Akt.-Ges. January 20, 1927.
288,253. Anhydrous zinc chloride, Production of. Metallbank und Metallurgische Ges. Akt.-Ges. April 9, 1927.
288,579. Iron-beryllium alloys, Process for improving the properties of. Siemens and Halske Akt-.Ges. April 12, 1927.
290,229. 6-chloro-2-amino-1-methylbenzene, Manufacture of sulphonic acids of. I.G. Farbenindustrie Akt.-Ges. May 10, 1927.
295,050. Diazo compound and dyestuffs therefrom, Manufacture of. Compagnie Nationale de Matières Colorantes et Manufactures de Produits Chimiques du Nord Reunies Etablissements Kuhlmann. August 5, 1927.
290,996. Cracking hydrocarbons. Gasoline Products Co., Inc. May 23, 1927.
298,084. 1 : 1 : 2-trichlorethane. I.G. Farbenindustrie Akt.-Ges. September 30, 1927.
301,342. Metals and metal compounds which are soluble in ammoniacal liquors, Recovery of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) August 24, 1927.
301,401. N-amino alkylation of amines. A Carpmael and K. S. Carpmael. I.G. Farbenindustrie Akt.-Ges. May 24, 1927.

301,402. Unsaturated aliphatic hydrocarbons, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) June 27, 1927.

301,403. Dibenzanthrone, Production of. I. B. Anderson, R. F. Thomson, J. Thomas, and Scottish Dyes, Ltd. July 22, 1927.

301,523. Esters, Production of. Imperial Chemical Industries, Ltd., and G. F. Horsley. August 3, 1927.

301,410. Azo-dyestuffs, Manufacture of. O. Y. Imray. (*I.G. Farbenindustrie Akt.-Ges.*) August 29, 1927.

301,545. 8-hydroxy-quinoline and its derivatives, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) September 2, 1927.

301,561. Aqueous solutions of carbon disulphide, Manufacture of. A. Carpmael (*I.G. Farbenindustrie Akt.-Ges.*) September 6, 1927.

301,562. Acetic anhydride from acetic acid, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) September 6, 1927.

301,565. Alkali cyanides, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) September 6, 1927.

301,577. Hydrogenation or reduction of organic compounds. O. Y. Imray. (*I.G. Farbenindustrie Akt.-Ges.*) September 19, 1927.

301,626. Condensation products of formaldehyde and urea, Method of obtaining. Pollopas, Ltd., E. C. C. Baly, and E. J. Baly. November 11, 1927.

301,696. Condensation products of urea and formaldehyde, Manufacture of I.G. Farbenindustrie Akt.-Ges. November 6, 1926. Addition to 261,029.

Applications for Patents

Bakelite Corporation and Wade, H. Phenolic resins. 37,138. December 15.

Barnes, R. S., Scottish Dyes, Ltd., and Thomas, J. Production of dyestuffs, etc. 36,571. December 11.

Blanc, G. A. Removal of ferric chloride during treatment of leucite, etc. 36,487. December 11.

Blane, E. R., Malcolm and Co. (Glasgow), Ltd., J., and Robertshaw, G. F. Sulphonation of oils, etc. 36,617. December 12.

Blane, E. R., Malcolm and Co. (Glasgow), Ltd., J., and Robertshaw, G. F. Sulphonation of fatty acids, etc. 36,618. December 12.

Blane, E. R., Malcolm and Co. (Glasgow), Ltd., J., and Robertshaw, G. F. Production of sulphonated products of oils, etc. 36,619. December 12.

British Thomson-Houston Co., Ltd. Cleaning liquid mercury, etc. 36,965. December 14. (United States, December 14, 1927.)

Bywater, D. Means for sealing storage chambers, etc., for volatile liquids. 36,541. December 11.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Moth-proofing media. 36,437. December 10.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of ar-tetrahydron phthols. etc. 36,438. December 10.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of condensation products. 36,439. December 10.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of condensation products. 36,589, 36,590. December 11.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of artificial products from wood. 36,730. December 12.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of soluble organic antimony compounds. 36,731. December 12.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Insecticides. 36,732. December 12.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of derivatives of organic antimony compounds. 36,872. December 13.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of hydroxy sulphaminic acids. 36,873. December 13.

Carpmael, A., and Schering-Kahlbaum Akt.-Ges. Manufacture of physiologically-active substance. 36,440. December 10.

Cederberg, I. W. Preparation of concentrated nitric acid. 36,575. December 11.

Coley, H. E. Treatment of ores, etc. 36,426. December 10.

Coley, H. E. Manufacture of zinc. 36,427. December 10.

Coley, H. E. Extraction of metals from ores. 36,813. December 13.

Consortium für Elektrochemische Industrie Ges. Manufacture of trichlorethylene. 36,998. December 14. (Germany, December 14, 1927.)

Co-operative Wholesale Society Ltd., Couche, C. W., and Glover, A. Decoloration of oils. 36,924. December 14.

Crockatt, W. C., and Crockatt and Sons, Ltd., W. Means for indicating impurities in water, etc. 36,651. December 12.

Deurs, J. A. S. van. Recovery of fats and oils. 36,538. December 11. (Denmark, January 2.)

Dewey and Almy Chemical Co. Containers. 37,125. December 15. (United States, December 17, 1927.)

Evans, A. F., Illingworth Carbonisation Co., Ltd., Illingworth, S. R., and South Metropolitan Gas Co. Apparatus for carbonisation of coal, etc. 36,443. December 10.

Faberj, A. Fertilisers. 36,815. December 13. (Italy, December 13, 1927.)

Fischer, F., and Pichler, H. Production of higher hydrocarbons 37,016. December 14. (Germany, July 23.)

Fischer, F. Production of higher hydrocarbons. 37,131. December 15. (Germany, September 22.)

Hall, A. J., and Silver Springs Bleaching and Dyeing Co., Ltd. Dyeing cellulose acetate products in black shades. 36,507. December 11.

Holzhydrolyse Akt.-Ges. Manufacture of wood sugar. 36,800. December 13. (Germany, December 14, 1927.)

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of anthraquinone, etc. 36,395. December 10.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of lubricating-oils. 36,396. December 10.

I.G. Farbenindustrie Akt.-Ges. and Johnson J. Y. Manufacture of condensation products. 36,397. December 10.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of water glass. 36,685. December 12.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of potassium nitrate. 36,686. December 12.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of compact metal articles from metal powders. 36,824. December 13.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Refining sulphur-olive oil, etc. 36,978. December 14.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of products of high state of oxidation from hydrocarbons. 36,979. December 14.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of nitric oxide from nitrosyl chloride. 36,981. December 14.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of metal carbonyls. 36,983. December 14.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of vat dyestuffs. 37,114, 37,115. December 15.

I.G. Farbenindustrie Akt.-Ges. Recovery of nitric acid. 36,394. December 10. (Germany, December 31, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of 4-chloro-1-amino-anthraquinone-2-sulphonic acid. 36,407. December 10. (Germany, December 8, 1927.)

I.G. Farbenindustrie Akt.-Ges. Fire preventing, etc., agents. 36,408. December 10. (Germany, December 10, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of azo-dyestuffs. 36,409. December 10. (Germany, December 10, 1927.)

I.G. Farbenindustrie Akt.-Ges. Concentrating aqueous acetic acid. 36,410. December 10. (Germany, December 8, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of hydroxythionaphthens. 36,411. December 10. (Germany, December 8, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of chromium oxide. 36,441. December 10. (Germany, December 10, 1927.)

I.G. Farbenindustrie Akt.-Ges. Production of sulphonic acids. 36,684. December 12.

I.G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 36,733. December 12. (Germany, December 12, 1927.)

Klönne, A. [Firm of]. Removing distillation products from gas-producers. 36,530. December 11.

Lewkowitsch, P. R. E. Refining fish oils. 36,961. December 14.

Maxwell, F. Reduction, fracture, etc., of sugar cane, etc. 37,044. December 14.

Maxwell, F. Rollers of sugar-cane crushing, etc., machines. 37,045. December 14.

Maxwell, F. Machines for treatment of sugar cane, etc. 37,046. December 14.

Metallges Akt.-Ges. and Woisin, H. E. Production of sulphuric acid. 36,667. December 12.

Moore, S. Distillation of coal, etc. 37,080. December 15.

Naugatuck Chemical Co. Vulcanising rubber. 36,415. December 10. (Unites States, November 1, 1926.)

Nicoresti, C. A. Cofman-and Nicoresti, G. Cofman-. Gelification and solidification of alcohol. 36,313. December 10.

Peachey, S. J. Accelerators for vulcanisation of rubber, etc. 36,773. December 13.

Soc. Anon. des Distilleries des Deux Sèvres. Separation of liquids. 36,696. December 12. (Belgium, January 26.)

Soc. de Produits Chimiques des Terres Rares. Titanium pigments, etc. 37,021. December 14. (Czecho-Slovakia, December 19, 1927.)

Straub, J. Preparation of organic peroxides. 36,550. December 11. (Holland, April 5.)

Ugarte, T. Cracking hydrocarbons. 36,451. December 10.

Union Chimique Belge Soc. Anon. Purification of coke-oven gas, etc. 36,963. December 14. (Belgium, October 19.)

Wheeler, T. S. Production of anhydrous glycerol, etc. 37,090. December 15.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall., pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised, 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6½d. to 6¾d. per lb. Crude 60's, 2s. per gall. 1929—1s. 11d. per gall.

ACID CRESYLIC 99/100.—2s. 5d. to 3s. per gall. 97/99.—2s. 2d. to 2s. 3d. per gall. Pale, 95%, 1s. 11d. to 2s. per gall. Dark, 1s. 9d. to 1s. 10d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—7¾d. to 8d. per gall. Unstrained, 7¼d. to 7½d. per gall.

BENZOLE.—Prices at works: Crude, 10d. to 10½d. per gall.; Standard Motor, 1s. 4d. to 1s. 4½d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 5d. to 1s. 10d. per gall. Firm. Pure, 1s. 10d. to 2s. 1d. per gall.

XYLOL.—1s. 3d. to 1s. 11d. per gall. Pure, 1s. 6d. to 1s. 7d. per gall.

CREOSOTE.—Cresylic, 20/24%, 9d. per gall.; Heavy, 7d. to 7¾d. per gall. Middle oil, 6d. to 6½d. per gall. Standard specification, 5½d. to 5¾d. per gall. ex works. Salty, 7¼d. per gall.

NAPHTHA.—Crude, 8½d. to 9d. per gall. Solvent 90/160, 1s. 1½d. to 1s. 2½d. per gall. Solvent 95/160, 1s. 2d. to 1s. 7d. per gall. Solvent 90/190, 11d. to 1s. 4d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.

NAPHTHALENE.—Crystals, £12 5s. to £14 10s. per ton. Quiet. Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 36s. 6d. to 42s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 4s. 6d. to 6s. 6d. per gall. 90/180, 2s. 3d. to 3s. 6d. per gal. Heavy, 1s. 9d. to 2s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100 %.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.

p-CRESOL 32/34° C.—2s. 3d. to 2s. 6d. per lb.

DICHLORANILINE.—2s. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8½d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—1s. 10d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 to £10 per ton. Good demand. Grey, £16 10s. per ton. Liquor, 9d. per gall.

CHARCOAL.—£5 15s. to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall, 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10½d. per gall. 16° Tw.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—2s. 11d. to 3s. 1d. per gall. Solvent, 4s. per gall.

WOOD TAR.—£3 to £4 per ton.

BROWN SUGAR OF LEAD.—£39 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£2 16s. 10d. to £3 10s. per ton, according to quality.

CADMIUM SULPHIDE.—5s. to 6s. per lb.

CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £54 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—4⅝d. to 5⅞d. per lb.

LAMP BLACK.—£32 10s. per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPHONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£55 to £60 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. 10d. to 7s. per lb.

ZINC SULPHUR.—11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 4½d. to 2s. 5d. per lb.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz., according to quantity.

Acid, Boric B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
Acid, Camphoric.—19s. to 21s. per lb.
Acid, Citric.—2s. 3d. to 2s. 4d. per lb.
Acid, Gallic.—2s. 8d. per lb. for pure crystal, in cwt. lots.
Acid, Pyrogallic, Crystals.—7s. 3d. per lb. Resublimed, 8s. 3d.
10½d. per lb.
Acid, Salicylic, B.P. pulv.—1s. 6d. to 1s. 9d. per lb. Technical.—
10½d. to 11½d. per lb.
Acid, Tannic B.P.—2s. 8d. to 2s. 10d. per lb.
Acid, Tartaric.—1s. 4½d. per lb., less 5%.
Acetanilide.—1s. 5d. to 1s. 8d. per lb. for quantities.
Amidol.—7s. 6d. to 9s. per lb., d/d.
Amidopyrin.—7s. 9d. to 8s. per lb.
Ammonium Benzoate.—3s. 3d. to 3s. 6d. per lb., according to quantity. 18s. per lb. ex Gum.
Ammonium Carbonate B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
Atropine Sulphate.—9s. per oz.
Barbitone.—5s. 9d. to 6s. per lb.
Benzonaphthol.—3s. to 3s. 3d. per lb. spot.
Bismuth Carbonate.—9s. 9d. per lb.
Bismuth Citrate.—9s. 3d. per lb.
Bismuth Salicylate.—8s. 9d. per lb.
Bismuth Subnitrate.—8s. 3d. per lb.
Bismuth Nitrate.—Cryst. 5s. 9d. per lb.
Bismuth Oxide.—12s. 3d. per lb.
Bismuth Subchloride.—10s. 9d. per lb.
Bismuth Subgallate.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
Bismuthi et Ammon Liquor.—Cit. B.P. in W. Qts. 1s. o½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts., 11d. per lb.
Borax B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
Bromides.—Ammonium, 2s. to 2s. 3d. per lb.; potassium, 1s. 8½d. to 1s. 11½d. per lb.; sodium, 1s. 11d. to 2s. 2d. per lb.; granulated, ½d. per lb. less; all spot. Large quantities at lower rates.
Calcium Lactate.—B.P., 1s. 2½d. to 1s. 3½d. per lb.
Camphor.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
Chloral Hydrate.—3s. 2d. to 3s. 4d. per lb.
Chloroform.—2s. 5½d. to 2s. 7½d. per lb., according to quantity.
Creosote Carbonate.—6s. per lb.
Ethers.—S.G. ·730—11d. to 1s. 0d. per lb., according to quantity; other gravities at proportionate prices.
Formaldehyde, 40%.—37s. per cwt., in barrels ex wharf.
Guaiacol Carbonate.—4s. 6d. to 4s. 9d. per lb.
Hexamine.—1s. 11d. to 2s. 2d. per lb.
Homatropine Hydrobromide.—30s. per oz.
Hydrastine Hydrochloride.—English make offered at 120s. per oz.
Hydrogen Peroxide (12 vols.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
Hydroquinone.—3s. 9d. to 4s. per lb., in cwt. lots.
Hypophosphites.—Calcium, 3s. 1d. per lb.; potassium, 3s. 5d. per lb.; sodium, 3s. 4d. per lb., in 1 cwt. lots, assorted.
Iron Ammonium Citrate.—B.P., 2s. 8d. to 2s. 11d. per lb. Green, 3s. 1d. to 3s. 4d. per lb.; U.S.P., 2s. 9d. to 3s. per lb.
Iron Perchloride.—18s. to 20s. per cwt., according to quantity.
Iron Quinine Citrate.—B.P., 8½d. to 9½d. per oz., according to quantity.
Magnesium Carbonate.—Light commercial, £31 per ton net.
Magnesium Oxide.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
Menthol.—A.B.R. recrystallised B.P., 21s. 6d. per lb. net; Synthetic, 10s. to 11s. per lb.; Synthetic detached crystals, 11s. to 16s. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.
Mercurials B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph., B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
Methyl Salicylate.—1s. 3d. to 1s. 6d. per lb.
Methyl Sulphonal.—8s. 9d. to 9s. per lb.
Metol.—9s. to 11s. 6d. per lb. British make.
Paraformaldehyde.—1s. 9d. per lb. for 100% powder.
Paraldehyde.—1s. 4d. per lb.
Phenacetin.—2s. 5d. to 2s. 8d. per lb.
Phenazone.—3s. 9d. to 4s. per lb.
Phenolphthalein.—6s. to 6s. 3d. per lb.
Potassium Bitartrate 99/100% (Cream of Tartar).—96s. per cwt., less 2½ per cent.
Potassium Citrate.—B.P.C., 2s. 6d. to 2s. 9d. per lb.
Potassium Ferricyanide.—1s. 9d. per lb., in cwt. lots.
Potassium Iodide.—16s. 8d. to 17s. 2d. per lb., according to quantity.
Potassium Metabisulphite.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
Potassium Permanganate.—B.P. crystals, 5½d. per lb., spot.
Quinine Sulphate.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
Resorcin.—2s. 10d. to 3s. per lb., spot.
Saccharin.—47s. per lb.; in quantity lower.
Salol.—2s. 3d. to 2s. 6d. per lb.
Sodium Benzoate, B.P.—1s. 8d. to 1s. 11d. per lb.
Sodium Citrate, B.P.C., 1911—2s. 3d. to 2s. 6d. per lb., B.P.C. 1923—2s. 8d. to 2s. 9d. per lb. U.S.P., 2s. 6d. to 2s. 9d. per lb., according to quantity.
Sodium Ferrocyanide.—4d. per lb., carriage paid.
Sodium Hyposulphite, Photographic.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
Sodium Nitroprusside.—16s. per lb.
Sodium Potassium Tartrate (Rochelle Salt).—95s. to 100s. per cwt. Crystals, 5s. per cwt. extra.
Sodium Salicylate.—Powder, 1s. 6d. to 1s. 7d. per lb. Crystal, 1s. 7d. to 1s. 8d. per lb.
Sodium Sulphide, pure recrystallised.—10d. to 1s. 1d. per lb.
Sodium Sulphite, Anhydrous.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
Sulphonal.—6s. 6d. to 6s. 9d. per lb.
Tartar Emetic, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
Thymol.—Puriss., 9s. 6d. to 9s. 9d. per lb., according to quantity. Firmer. Natural, 12s. 6d. per lb.

Perfumery Chemicals

Acetophenone.—6s. 6d. per lb.
Aubepine (ex Anethol).—11s. per lb.
Amyl Acetate.—2s. 6d. per lb.
Amyl Butyrate.—4s. 9d. per lb.
Amyl Salicylate.—2s. 9d. per lb.
Anethol (M.P. 21/22° C.).—5s. 3d. per lb.
Benzyl Acetate from Chlorine-free Benzyl Alcohol.—1s. 10d. per lb.
Benzyl Alcohol free from Chlorine.—1s. 10d. per lb.
Benzaldehyde free from Chlorine.—2s. 6d. per lb.
Benzyl Benzoate.—2s. 3d. per lb.
Cinnamic Aldehyde Natural.—15s. 6d. per lb.
Coumarin.—8s. 6d. per lb.
Citronellol.—11s. per lb.
Citral.—8s. per lb.
Ethyl Cinnamate.—6s. per lb.
Ethyl Phthalate.—2s. 9d. per lb.
Eugenol.—12s. per lb.
Geraniol (Palmarosa).—20s. per lb.
Geraniol.—6s. 6d. to 11s. per lb.
Heliotropine.—5s. per lb.
Iso Eugenol.—16s. per lb.
Linalol.—Ex Bois de Rose, 13s. per lb. Ex Shui Oil, 9s. 3d. per lb.
Linalyl Acetate.—Ex Bois de Rose, 17s. 6d. per lb. Ex Shui Oil Linalol. 10s. 6d. per lb.
Methyl Anthranilate.—8s. per lb.
Methyl Benzoate.—4s. per lb.
Musk Ketone.—34s. per lb.
Musk Xylol.—7s. per lb.
Nerolin.—3s. 9d. per lb.
Phenyl Ethyl Acetate.—11s. per lb.
Phenyl Ethyl Alcohol.—10s. 6d. per lb.
Rhodinol.—45s. per lb.
Safrol.—1s. 6d. per lb.
Terpineol.—1s. 6d. per lb.
Vanillin.—16s. per lb.

Essential Oils

Almond Oil.—Foreign S.P.A., 10s. 6d. per lb.
Anise Oil.—2s. 9d. per lb.
Bergamot Oil.—23s. per lb.
Bourbon Geranium Oil.—20s. per lb.
Camphor Oil.—9d. per lb.
Cananga Oil, Java.—12s. per lb.
Cinnamon Oil Leaf.—6s. 9d. per oz.
Cassia Oil, 80/85%.—6s. 6d. per lb.
Citronella Oil.—Java, 2s. 2d. per lb., c.i.f. U.K. port. Ceylon, pure, 1s. 11d. per lb.
Clove Oil (Pure 90/92%).—9s. 6d. per lb.
Eucalyptus Oil, Australian, B.P. 70/75%.—2s. per lb.
Lavender Oil.—Mont Blanc, 48/50%. Esters, 16s. 3d. per lb.
Lemon Oil.—15s. 6d. per lb.
Lemongrass Oil.—4s. per lb.
Orange Oil, Sweet.—22s. 6d. per lb.
Otto of Rose Oil.—Anatolian, 35s. per oz. Bulgarian, 75s. per oz.
Palma Rosa Oil.—12s. 6d. per lb.
Peppermint Oil.—Wayne County, 16s. per lb.; Japanese, 8s. 9d. per lb.
Petitgrain.—9s. per lb.
Sandalwood.—Mysore, 28s. per lb., 95% 19s. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, December 20, 1928.

THE amount of business which has been booked during the past week has been quite good, especially for next year's contracts. The improved export business has been maintained.

General Chemicals

ACETATE OF SODA is firm at £21 10s. to £22 per ton and supplies are still rather short.

ACETONE.—Price firm at £75 to £77 10s. per ton. Higher prices will come into force on January 1. Supplies are rather short.

ACETIC ACID.—In steady demand; prices unchanged.

ACID LACTIC is unchanged.

AMMONIUM CHLORIDE is unchanged.

ARSENIC is unchanged.

BARIUM CHLORIDE.—Very little is obtainable, especially for early delivery, some manufacturers having sold out until July next; nominal price £11 to £11 10s. per ton.

CITRIC ACID is rather slow at 2s. 4½d. per lb.

COPPER SULPHATE is unchanged.

CREAM OF TARTAR is rather quiet at about £97 10s. to £99 per ton less 2½% for B.P. 99/100%.

FORMALDEHYDE.—The good demand has continued and the position is much firmer. The price is at present unchanged at about £39 per ton.

FORMIC ACID is in good demand at £43 per ton for 85%.

LEAD ACETATE.—White at £42 10s. per ton, brown at £1 per ton less, with a steady demand.

LEAD NITRATE.—£36 to £36 10s. per ton and in good demand.

LIME ACETATE is unchanged.

LITHOPONE.—£19 to £20 10s. per ton with a fair demand.

METHYL ACETONE is unchanged at £58 to £60 per ton for 45%. The position is firm and the demand good.

METHYL ALCOHOL is firm, with prices advancing.

OXALIC ACID is firm at £30 10s. to £32 10s. per ton, according to quantity.

PERMANGANATE OF POTASH.—The improvement in the demand has continued; price unchanged at 5¼d. to 5½d. per lb. for B.P.

POTASSIUM CARBONATE AND CAUSTIC.—Unchanged and in steady demand.

POTASSIUM CHLORATE is unchanged at £28 per ton and firm.

PRUSSIATE OF POTASH.—A good trade is passing and the price is unchanged at £63 10s. to £65 10s. per ton, according to quantity, and in good demand.

SODA BICHROMATE is very firm at 3½d. per lb.; prices advancing.

SODIUM CHLORATE is firm at £25 to £26 per ton.

SODIUM PRUSSIATE.—4½d. to 5¼d. per lb., according to quantity, with a firm position and in good demand.

SULPHATE OF ALUMINA is unchanged at about £6 15s. to £7 per ton, but in short supply.

TARTARIC ACID is unchanged at 1s. 4½d. to 1s. 4¾d. per lb., less 5%; demand rather slow.

TARTAR EMETIC is unchanged at about 10½d. per lb.

ZINC SULPHATE is unchanged.

Coal Tar Products

The coal tar products market is quiet, with very little inquiry. Market prices remain as below, although some spot parcels are changing hands at slightly below these figures.

MOTOR BENZOL remains scarce, the price being about 1s. 7½d. per gallon f.o.r. makers' works.

SOLVENT NAPHTHA is firm at 1s. 2¼d. per gallon on rails.

HEAVY NAPHTHA is unchanged at 1s. 1d. to 1s. 1½d. per gallon on rails.

CREOSOTE OIL remains weak, and can be bought at 5¼d. per gallon on rails in the North, and at 6d. per gallon in London.

CRESYLIC ACID is unchanged, the 98/100% quality being quoted at about 2s. per gallon f.o.b., and the dark quality, 95/97%, at about 1s. 10d. per gallon f.o.b naked.

NAPHTHALENE remains weaker. The firelighter quality can be bought at about £4 10s. per ton, the 74/76 quality at £5 per ton and the 76/78 quality at £6 to £6 5s. per ton.

PITCH is unchanged at about 40s. per ton f.o.b. U.K. port.

Nitrogen Products

Sulphate of Ammonia.—The market continues firm at £9 15s. to £9 19s. per ton, f.o.b. U.K. port in single bags. It is understood that good sales have been made at these prices. The demand has chiefly come from the sugar growing countries. Merchants in many parts of the country have reported small purchases of sulphate of ammonia. This livening interest will probably extend during January and develop in the spring into an insistent daily demand for the product.

Nitrate of Soda.—Good sales continue to be made at scale prices.

Latest Oil Prices

LONDON, December 19.—LINSEED OIL was inactive and unchanged. Spot, ex mill, £29; December to April, £28 2s. 6d.; May-August, £28 10s.; and September-December, £28 15s., naked. RAPE OIL was steady.. Crude extracted, £42 and technical refined, £44, naked, ex wharf. COTTON OIL was quiet. Egyptian crude, £30; refined common edible, £35 10s.; and deodorised £37 10s., naked, ex mill. TURPENTINE was inactive, unchanged. American, spot, 47s., and January April, 47s. 9d. per cwt. ROSIN dull and lower. American B/D, 20s. 3d.; E, 20s. 6d.; F/I, 20s. 9d.; N., 22s.; WG., 24s.; and WW., 26s. 6d. per cwt.

HULL, December 19.—LINSEED OIL.—Spot to December, £28 12s. 6d.; January-April and May-August, £28 10s.; September-December, £28 15s. per ton, naked. COTTON OIL.—Crude spot (new) and December to February, £29 5s.; edible refined, spot and December-February, £33 5s.; technical spot, £32 10s.; deodorised spot, £35 5s. per ton, naked. PALM KERNEL OIL.—Crushed, 5½ per cent., £37 5s. per ton. GROUNDNUT OIL.—Crushed-extracted spot, £37; deodorised spot, £41 per ton. SOYA OIL.—Extracted and crushed, £33 10s.; deodorised, £37 per ton. RAPE OIL.—Crude-extracted, £40 15s.; refined, £42 15s. per ton, net cash terms, ex mill. TURPENTINE, CASTOR OIL, and COD OIL unaltered.

South Wales By-Products

BUSINESS in South Wales by-products continues to be on quiet lines. The holidays are affecting demand at the moment, and prices generally are nominal. Pitch, for which there is only a small call, continues to change hands round 38s. to 42s. 6d. per ton, prompt delivery. Refined tars are the healthiest features of the market, the demand being steady, if moderate. Prices are unchanged, gasworks tar changing hands at from 6½d. to 7d. per gallon, delivered, and coke oven tar at from 7d. to 7¾d. per gallon, delivered. Road tar values are steady round the 13s. to 16s. per barrel mark, filled free or plus barrel hire. Crude naphthalene, which has practically no demand, continues to be quoted round the 80s. per ton mark, while whizzed, which is also without demand, remains steady round about 100s. per ton. Patent fuel and coke exports are maintaining their improvement, but prices are unchanged. Patent fuel, ex-ship Cardiff, from 20s. to 21s. 6d. per ton; ex-ship Swansea, 19s. 6d. to 19s. 9d. per ton. Coke, best foundry, 32s. 6d. to 37s. per ton; furnace, 19s. to 21s. per ton. Oil imports over the last four ascertainable weeks amounted to 11,821,337 gallons.

Activities of the Paint Research Association

DR. L. A. JORDAN, director of the Research Association of the British Paint, Colour and Varnish Manufacturers, has just completed a tour of four important centres of paint manufacture, viz., Newcastle, Hull, Liverpool and Birmingham. In each city he has delivered to the technical staffs of member firms a lecture on certain aspects of paint and varnish technology and manufacture in the United States, based on his own observations during a recent tour of that country. The lecture also described some of the current activities at the Paint Research Station, Teddington. A series of lantern slides which were exhibited depicting various aspects of defects in films as revealed by the microscope was especially instructive and aroused great interest. At Hull, Mr. Runton, the chairman of the Hull Paint, Colour and Varnish Manufacturers' Association, invited all members of that Association to dine with him and to listen afterwards to Dr. Jordan's address. At Liverpool and Birmingham the lecture was held before the annual dinner of the respective local associations of paint, colour and varnish manufacturers. It is hoped that such visits and lectures as these, given periodically in the various centres where the chief manufacturers have their works, will be of direct benefit to the industry, and will materially help to keep the interest in research well before the members. Dr. Jordan will be lecturing in Bristol on January 7, and in Glasgow on January 31, to the members in these areas.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, December 18, 1928.

DURING the past week the heavy chemical market has been rather quieter possibly on account of the near approach of holidays. There are no changes in prices of any importance to record for prompt delivery, but it has been advised that bichromate prices for next year are advanced.

Industrial Chemicals

ACETONE, B.G.S.—Quoted £74 10s. to £77 10s. per ton, ex wharf, according to quantity. There is still little available for immediate delivery and there is indication that the price will be advanced again shortly.

ACID ACETIC, 98/100%.—Glacial £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £32 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Quoted 6¾d. per lb., delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Now offered at 2s. 6½d. per lb., less 5%, ex wharf, prompt shipment from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC, 80° quality.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer from the Continent at 3¼d. per lb., ex wharf. Spot material quoted 3½d. per lb., ex store. In better demand.

ACID SULPHURIC.—£2 15s. per ton, ex works, for 144° quality. £5 15s. per ton for 168° quality. Dearsenicated quality 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 4½d. per lb., less 5%, ex wharf. Offered for prompt shipment at 1s. 4d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—On offer at £5 10s. per ton, c.i.f. U.K. ports. Spot material quoted £5 15s. per ton, ex store.

ALUM, LUMP POTASH.—Quoted £8 7s. 6d. per ton, c.i.f. U.K. ports, prompt shipment from the Continent. Crystal meal quoted £8 10s. per ton, ex store.

AMMONIA, ANHYDROUS.—Quoted 9½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE, 98/100%.—Now quoted £37 10s. per ton, ex wharf, prompt shipment from China.

ARSENIC, WHITE POWDERED.—Quoted £18 10s. per ton, ex wharf, prompt dispatch from mines. Spot material on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—Quoted £9 15s. per ton, c.i.f. U.K. ports, prompt shipment from the Continent. Spot material on offer at £11 per ton, ex wharf.

BLEACHING POWDER.—British manufacturers' contract price to consumers £6 12s. 6d. per ton, delivered minimum 4-ton lots. Continental on offer at £6 10s. per ton, ex wharf.

CALCIUM CHLORIDE.—British manufacturers' price £4 5s. to £4 15s. per ton, according to quality and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports for export.

COPPER SULPHATE.—Quoted £25 5s. per ton, ex wharf, but some cheaper parcels on offer in limited quantity.

FORMALDEHYDE, 40%.—Firmer. Offered for prompt shipment, c.i.f. U.K. ports, at £37 per ton. Spot material quoted £38 10s. per ton, ex store.

GLAUBER SALTS.—English material unchanged at £5 per ton, ex store, or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—On offer at £29 10s. per ton, ex store.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted £41 per ton, ex store. Brown on offer at about £31 10s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2½%, delivered.

POTASSIUM BICHROMATE.—4½d. per lb., delivered, minimum 4-ton lots. Under 4-ton lots ½d. per lb. extra.

POTASSIUM CARBONATE, 96/98%.—Offered from the Continent at £25 per ton, c.i.f. U.K. ports. Spot material available at £26 per ton, ex store.

POTASSIUM CHLORATE, 99¾/100%, POWDER.—Quoted £22 15s. per ton, c.i.f. U.K. ports.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5½d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 6¾d. per lb., ex store. Offered from the Continent at 6½d. per lb., ex wharf, prompt shipment.

SODA CAUSTIC.—Powdered, 98/99%, £17 17s. 6d. per ton; solid, 76/77%, £14 10s. per ton, and 70/72% £13 12s. 6d. per ton, minimum 4-ton lots, carriage paid on contract. Spot material 10s. per ton extra.

SODIUM ACETATE.—On offer for prompt delivery at about £21 5s. per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3d. per lb., delivered buyers' works, minimum 4-ton lots. Under 4 and over 2-ton lots, 1/16d. per lb. extra. Under 2-ton lots, 3¼d. per lb.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 3s. 9d. per ton, ex quay, minimum 4-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots. Prices for next year unchanged.

SODIUM NITRATE.—Price now £10 6s. per ton, carriage paid buyers' sidings for 95% quality. Usual extras for refined quality.

SODIUM PRUSSIATE.—Spot material on offer at 4¾d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE).—Prices, 50s. per ton, ex works; 52s. 6d. per ton delivered, for unground quality. Ground quality, 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption :—Solid, 60/62%, £9 per ton; broken, 60/62%, £10 per ton; crystals, 30/32%, £7 2s. 6d. per ton, delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra. Prices for next year unchanged.

SULPHUR.—Flowers, £12 per ton; roll, £10 15s. per ton; rock, £10 12s. 6d. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE, 98%.—British material now quoted £22 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Offered from the Continent at about £10 5s. per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

British Beet Sugar Prospects

THE Beet Sugar Factories Committee of Great Britain states that reports from the growing areas with regard to the season now closing have been encouraging. The yield of sugar beet per acre is greater than last year. The beets, as judged by the sugar content, have been of a high quality, thus improving the grower's price as provided for in the beet contract. From figures supplied by the factory companies, the amount distributed among growers for October deliveries of beet has been £643,378, and £1,157,870 for November deliveries, these sums representing the payments due to the growers after deduction of railway carriage or road haulage to the factory, the cost of seed, the cash advances made on the crop during cultivation, and the by-products purchased by the growers. The demand from the growers for dried beet pulp, offered at favourable prices, has been an encouraging feature of the past season's work. The companies have decided to offer jointly, in the name of the committee, the beet contract as agreed with the National Farmers' Union, for the years 1929 and 1930, to any farmer in England and Wales having suitable land and whose farm is situated outside the present operating areas of the factories.

Company News

W. AND T. AVERY.—The interim dividend will again be 3 per cent.

DOMINION TAR AND CHEMICAL CO.—Final dividend of 9 per cent. on the ordinary shares, making 14½ per cent. for the past year.

BRITISH COTTON AND WOOL DYERS.—The net profit for the half-year ended September 30 was £42,474, making the credit balance £63,901.

AMERICAN POTASH AND CHEMICAL CORPORATION.—Ordinary dividend of 25 cents and an extra dividend of 25 cents (50 cents in all per share), both payable on December 31.

MELSO.—The directors have decided to defer payment of dividend on the 7½ per cent. cumulative participating preference shares due January 1 until completion of accounts for year.

ARIZONA COPPER.—Dividend of $2.50 per share for the quarter ending December 31, payable January 2. This makes a total dividend declaration of 8 per cent. in respect of the year to December 31, 1928.

LONDON TIN SYNDICATE.—Dividend of 40 per cent. for the year ended September 30. Since the last dividend was paid the issued capital has been increased from £250,000 to £500,000, all of which ranks for the dividend now declared.

BENN BROTHERS, LTD.—The directors have declared interim dividends, less tax, payable on February 15, 1929, of 3 per cent. on preference shares, 6¼ per cent. on ordinary shares (same as last year), and 1s. 3d. per share on deferred shares.

UNITED INDIGO AND CHEMICAL CO.—The directors have decided upon the payment of interim dividends of 5 per cent. on the participating cumulative preference shares and 5 per cent. on the ordinary shares, subject to income tax of 4s. in £.

SANTIAGO NITRATE.—The report for the year ended June 30, 1928, states that gross profit was £3,327, to which is added interest on deposit at bank and transfer fees, making £4,391. After providing for London expenses, stoppage expenses in Chile, and Chilean income-tax, there remains a debit balance of £1,306, which has been carried to the profit and loss account. Agents in Chile have been approached with a view to purchasing the oficina, and permission has been given to examine the property. The meeting will be held at 27, Leadenhall Street, London, on December 28.

PAN DE AZUCAR NITRATE.—The accounts of the Pan de Azucar Nitrate Co. for the year ended June 30 show a loss, after charging £17,322 for extraordinary repairs, of £21,236 (against a net profit of £10,326 for 1926-27). Allowing for the credit balance of £14,394 brought forward, and the interim dividend of 5 per cent. paid in April last, there remains a debit of £11,242, which is carried forward. For 1926-27 the total dividend was 15 per cent. No nitrate was manufactured at the company's oficina during the year under review. The elabration of nitrate was commenced on July 19 following the completion of extensive alterations and additions to plant, the cost of which was £29,990; £12,668 of this amount has been capitalised.

Tariff Changes

FRANCE.—With the issue of December 13 of *The Board of Trade Journal* is published the first part of a translation of the French Customs Import Tariff in its present form, showing the "Minimum" Tariff rates of duty, which are those applicable to goods originating in the United Kingdom and other countries enjoying most-favoured-nation treatment in France. Five pages are devoted to chemicals and dyestuffs.

AUSTRALIA.—Ethyl cellulose has been added to the list of "Raw Materials" for the purpose of the conditions governing the application of the British Preferential Tariff.

POLAND.—Customs Duty on sulphuric acid of any degree of concentration has been reduced for the period November 25 to December 31 and is leviable at 20 per cent. of the nominal duty.

PORTUGAL.—A decree of November 30 introduces a new heading in the Portugese Customs Tariff for solvents with a duty of 20 centavos (gold) per metric ton under the Minimum Tariff and twice that amount under the Maximum Tariff.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to January 19, 1929.

KIFLU.

494,356. Class 1. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives. Ring Gesellschaft Chemischer Unternehmungen mit beschrankter Haftung (a joint stock company, organised under the laws of Germany), Osnabruckerstrasse 98, Seelze, near Hanover, Germany; manufacturers.—August 22, 1928.

LUMINOL.

494,631. Class 1. Paints. Arthur Sanderson and Sons, Ltd., 52, 53, 54, 55, Berners Street, London, W.1; manufacturers.—August 31, 1928. (Concurrent user claimed from January 1, 1924. Sect. 21.)

CROID AERO GLUE.

495,058. Class 1. Glue. The Improved Liquid Glues Co., Ltd., Imperial House, 15, 17 and 19, Kingsway, London, W.C.2; manufacturers.—September 14, 1928. (To be Associated. Sect. 24.) Registration of this trade mark shall give no right to the exclusive use of the word "Aero."

VICO.

495,439. Class 1. Glue. Joseph Gilman and Son, Ltd., corner of Stafford Street and Gem Street, Birmingham; drysalters, oil and colourmen.—September 28, 1928. (By consent.)

ASMADYN.

496,555. Class 3. Chemical substances prepared for use in medicine and pharmacy. Thomas Hubert Stephens, 104, High Holborn, London, W.C.1; manufacture.—November 1, 1928.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

PIG IRON AND FERRO MANGANESE.—The South African Railways and Harbours are calling for tenders to be presented by January 31, 1928, for the supply of pig iron and ferro-manganese. (Reference No. A.X. 7,273.)

SHELLAC AND GUM LAC.—Commission Agents in Sao Paulo desire the representation of a British exporter of shellac and lac. (Reference No. 492.)

Continuous Coal Carbonisation: A New Plant

IT is announced by the directors of Continuous Coal Carbonisation, Ltd., that an agreement has been come to between the company and one of an important group of collieries for the provision of a suitable site near Newcastle-on-Tyne, with a view to the erection of a plant to carbonise 5,000 tons of coal per day. The colliery undertakes to supply coal to such plant on an agreed cost plus profit basis. The necessary organising and financial arrangements for the erection of the plant and the marketing of the products are to be provided for by the formation of a new company, in which Continuous Coal Carbonisation, Ltd., will have a substantial interest. This plant is intended to be the nucleus of a general application of the process of the Continuous Coal Carbonisation Co. to the counties of Durham and Northumberland. A satisfactory feature of the agreement is that in addition to the existence of local markets for the smokeless fuel, oil and other products of the company, the site is ideal for export purposes and possesses special facilities for the disposal of the gas.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

BROOKS-WEIR, LTD., 6/8, Addle Street, Wood Street, E.C., manufacturing perfumers. (C.C., 22/12/28.) £18 8s. 2d. June 28.

London Gazette, &c.

Company Winding Up Voluntarily

CHEMICAL ENGINEERING CO. (MANCHESTER), LTD. (C.W.U.V., 22/12/28.) At an extraordinary general meeting of the members of the above named company, duly convened, and held at 90, Deansgate, Manchester, on November 19, the following resolutions were duly passed as extraordinary resolutions; and at a subsequent extraordinary general meeting of the members of the said company, also duly convened, and held at the same place on December 5, such resolutions were duly confirmed as special resolutions, viz.:—1. "That the Chemical Engineering Co. (Manchester), Ltd., be wound up voluntarily." 2. "That William Nicklin, of 90, Deansgate, Manchester, Incorporated Accountant, and Harold Moreton Moss, of Northwich, Chester, solicitor, be and are hereby appointed the liquidators to conduct the winding-up."

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

URANIA PETROLEUM CO., LTD., London, E.C. (M., 22/12/28.) Registered November 19, trust deed dated August 20, 1928, securing $30,000; charged on properties in Shelby County State of Tennessee, etc. *——. November 12, 1928.

Receivership

LACTINE, LTD. (R., 22/12/28.) J. Strickland, solicitor, of Haslemere, Surrey, was appointed Receiver on December 2, 1928, under powers contained in debenture dated December 8, 1921.

New Companies Registered

EINSTEIN'S ELECTRO CHEMICAL PROCESS, LTD.—Registered as a public company on December 15. Nom. capital £500,000 in 250,000 8 per cent. participating preference shares of £1 each and 1,250,000 ordinary shares of 4s. each. To acquire from V. I. Einstein the process invented by him for the metalising of materials by electro-chemical action, to carry on the business of electricians, mechanical engineers, electro-platers, manufacturers of and dealers in chemicals and drugs, etc. Registered office: 16, St. Helens Place, London, E.C.3.

HEKLA PRODUCTS, LTD.—Private company. Registered December 17. Capital £100 in 2s. shares. To carry on the business of manufacturers of all kinds of polishes and cleaning preparations, oil and colourmen, manufacturers of and dealers in chemical products, etc. The subscribers (each with one share) are R. J. H. Hope and R. H. King. Registered office: 43, Gower Street, London, W.C.1.

G. K. SYNDICATE, LTD.—Private company. Registered December 13. Capital £6,000 in £1 shares. To acquire any inventions relating to extinguishing outbreaks of fire, and to carry on the business of importers, exporters and manufacturers of and dealers in fire extinguishers and appliances, engineers, chemists, etc. Directors: F. Knowles, C. W. Gott and B. Heilbron. Registered office: Antifyre House, 11, Golden Square, London, W.1.

TANNING INDUSTRIES, LTD.—Registered as a public company on December 12. Capital, £100,000 in £1 shares. To acquire and hold shares, stocks, debentures, securities, and other interests in any company having for its main business or object or being interested in the carrying on of the business of tanners, skinners, curriers, leather dressers, hide and skin merchants, fellmongers, leather factors and merchants, glue and size manufacturers, mill furnishers, tanning material manufacturers, dealers in all kinds of leather, hides, skins, horns, hoofs, bones, wool and hair and tanning materials and all other articles used by tanners, curriers, and leather manufacturers, or by fellmongers and boot and shoe manufacturers, etc. Directors: R. H. Posnett and J. G. Withinshaw.

Chemical Workers' Wages: Conference Adjourned

NEGOTIATIONS for improved wages and working conditions for 20,000 workers in the drug and fine chemical industry throughout the country were opened in London on Tuesday.

A conference was held at the Midland Hotel, St. Pancras, between the Employers' Association and the National Union of Drug and Chemical Workers to consider the union's claim for a reduction of hours from 48 to 44 per week, with 12 days holiday annually instead of six, and for the regrading of packers and other classes of operatives, the readjustment of the rates of female and junior workers, and numerous wage increases for other grades of adult workers.

The union last made a general wage demand in 1924, when the employers pointed out that conditions, both nationally and internationally, were such that the industry could not afford an increased wage bill. The union then withdrew its proposals.

The case for the union was presented on Tuesday by Mr. A. J. Gillian, who analysed the profits, prices and position of the industry.

The employers' representatives intimated that they were not in a position to give the application their full consideration at that conference. They would hold a separate meeting and communicate their reply to the union at another joint conference to be arranged in the New Year.

Mr. Gillian stated later that if the employers' answer was not regarded as satisfactory the union would ask for the reference of its claim to arbitration.

Safeguarding of Key Industries: "Xanthate"

A REPRESENTATION has been made to the Board of Trade under Section 10(5) of the Finance Act, 1926, regarding potassium xanthogenate ["Xanthate"]. Any communication on the matter should be addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, London, S.W.1, within one month from the date of this notice, December 19, 1928.

The Treasury have made an Order under Section 10(5) of the Finance Act, 1926, continuing till June 30, 1929, the exemption from duty of R. acetone, acetone fermentation, acetone synthetic and radium compounds. The Treasury Order will shortly be published by the Stationery Office.

Benn Brothers' Other Journals

THE CABINET MAKER.—A Nation of Shopkeepers; Christmas Display Windows; Underground Windows; Modern Furniture Design.

THE ELECTRICIAN.—"The Rating of Electrical Machinery," by Wallace Ford; "The Attenuation of Wireless Waves Over Towns," by R. H. Barfield and G. H. Munro; "The Electrical Equipment of X-ray Apparatus," by L. G. H. Sarsfield.

THE FRUIT GROWER.—Where the Dates Come From: Northern African Tour (illustrations); "Black Currant Culture," by R. G. Hatton.

GARDENING ILLUSTRATED.—Attractive Shrubs in Winter; Mistletoe and Its Host Plants; Dwarf Campanulas; Mountain Limestone in Rock Garden Construction.

THE GAS WORLD.—"The Evolution of the Gas Meter," by A. T. Gilbert; The Dry Cooling of Coke by the Sulzer Plant; Developments in the Gas Supply at Stockport.

THE HARDWARE TRADE JOURNAL.—Christmas Issue; Hardware Miscellany; "Coals of Fire"; Students' Note Book: Percentages and Calculations; Old Pewter (illustrated).

THE TIMBER TRADES' JOURNAL.—An Open Mind at Christmas; Trade on the Pacific Seaboard; Norway's Timber Trade; Sawmill: Saw Sharpening Methods.